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RUBBER CULTIVATION IN CEYLON.

(Being No. 4 of the R. B. Gardens Circulars.)

THE growth of the cycling trade, and other industries in which rubber is used, has caused a great increase in the demand for rubber. That the price has not correspondingly increased is chiefly due t the discovery in West Africa of a new rubber-yielding tree, *Kickxia africana.* The collection of rubber from wild trees is carried on in a reckless manner, and the trees are being gradually exterminated. The rubber collectors have thus to go further and further inland every year for their supplies, and the cost of the rubber is thus increased by the difficulties of transport. There seems therefore a likelihood that the planting of the best kinds of rubber may prove a profitable industry.

The World's annual consumption of rubber is now over 100,000,000 lb., worth more than £10,000,000 sterling. Of this, from one-third to one-half comes from Para, which exported in 1895, 45,788,613 lb.

There are many trees which yield rubber in different parts of the World. Most of them, however, are unsuited for cultivation for various seasons: some are climbers requiring large trees as supports, some yield very little rubber or rubber of poor quality, and others do not yield rubber until they are twenty-five or more years old. The chief kinds likely to be useful in cultivation are Ceara rubber *(Manihot Glaziovii)*, Panama rubber *(Castilloa elastica)*, Para rubber *(Hevea brasiliensis)*, and perhaps African or Lagos rubber *(Kickxia africana)*.

The cultivation of Ceara rubber was energetically taken up in Ceylon about twelve or fourteen years ago, but the returns were found unsatisfactory, although the plant grew very well indeed. There are but few trees now in cultivation. Panama rubber is also scarce in Ceylon, and has not given very satisfactory results. The only important rubber at the moment is the Para kind, which alone is dealt with in the remainder of this Circular. This tree is well suited to the climate of the low-country in the south-west of Ceylon, is readily cultivated, and gives a fair yield of rubber. Para rubber is the best quality upon the market, and obtains the highest and most uniform prices.

The town of Para occupies a position near the mouth of one of the vast embouchures of the Amazons, in about south latitude 1°, but the district of the same name extends over a vast forest region to the south and west, throughout which, and the enormous forests of Central and Northern Brazil, *Hevea brasiliensis* and allied species are abundantly found. The climate is remarkable for its uniformity of temperature, usually not exceeding 87°F. at midday, or below 74° at night. The greatest heat recorded is 95°, and the mean for the year is 81°. The rainfall occurs principally during the months from January to June, the maximum being in April, when it reaches 15 in. For the remaining six months of the year very little falls, but there are fine days in the wet season, and occasional showers in the dry. The whole country is covered with dense, moist forests, and the soil near the numerous and gigantic rivers is deep, heavy, and very fertile. During the wet season much of the low-lying country near the Amazons' mouth is flooded. In the *gapos* near Para, visited by Mr. Cross, he found a flat district only three or four feet above the highest tides, and completely intersected with water-courses at low tide, filled with a soft, rich mud. The forest here, in which caoutchouc

collecting was vigorously carried on, was 80 or 100 ft. high and very damp and unhealthy, the soil full of moisture and very rich and fertile. The young plants, however, were not often observed to grow actually within the reach of the tides, but it is evident that they must frequently be subject to be partially covered with water.—TRIMEN, *Notes on Rubber-yielding Plants.*

Para rubber was introduced into Ceylon in 1876, when the young plants obtained from Brazil at the expense of the Indian Government were planted in Henaratgoda Garden. These are now very fine trees, with an average height of about 60 ft., and average girth at 6 ft. above the ground of 4 ft. From their seed other plantations have been made in the Botanic Gardens, and also by the Forest Department. A large quantity of seed has been sold to private planters since 1886. There are about 450 trees in the Botanic Gardens, producing about 100,000 seeds per annum.

The number of trees on private estates in Ceylon is probably about 200,000, of various ages from one to twelve years. This number represents an area of about 750 acres.

CLIMATE.—From the description of the climate of Para quoted above, it will at once be evident that only the wet, low-lying country in the south-west of Ceylon is suitable for the growth of *Hevea.* The best climate is probably that of the country lying between Kalutara and Ratnapura. Whilst the tree will grow at Peradeniya, (elevation 1,576 ft.) it suffers much from cold, and grows very much more slowly than in the low-country. Probably about 550 ft. or 600 ft. will be found to be the maximum elevation for successful culture. The tree is quite unsuited for cultivation in the dry regions of the Island.

SOIL.—In its native country *Hevea* is a jungle tree usually growing in deep, rich, alluvial soil which is liable to be flooded during the wet seasons. The earliest plantations made in Ceylon were therefore made on low-lying land subject to floods. It was found that if the plants were well grown up, flooding did them no harm, whereas it was fatal to seedlings or very young plants. It would seem, therefore, that what the plants really require is a damp soil, and this has been borne out by local experience. The immense level area of the Amazon valley tends to prevent floods of any great depth, whereas in Ceylon the valleys are narrower, and the water may easily rise several feet. Land liable to frequent flooding should therefore be avoided.

Chena land has been tried at Edangoda, but the result has been unsatisfactory; sandy soil also has been found unfavourable to the growth of *Hevea*, and the tree also grows badly where exposed to much wind.

It would appear therefore that the most suitable soil and situation for this tree is fairly flat land, at about sea level, with good alluvial soil, preferably jungle land, and not sandy. The land should not be subject to frequent floods or strong winds.

The area of land in Ceylon suitable for profitable rubber cultivation is thus comparatively small, possibly not more than 10,000 acres, but, on the other hand, this cultivation need not interfere with that of coconuts.

CULTIVATION.—*Hevea* forms a moderately tall tree, not very much branched. It begins to flower at about six years old, but for planting purposes the seed of more mature trees (twelve or more years old) is preferable.

About February, in Ceylon, the leaves mostly turn brown and drop off, and the flowers soon afterwards appear. They are followed by large woody fruits, each containing three seeds, which ripen in July and August. The fruits open explosively, usually in the hot part of the day, and scatter the seeds to some distance. The seed is very large, weighing about half an ounce. It has a hard seed coat, and the interior substance is very oily.

The seed soon loses its power of germination, and ought to be sown within a week of its falling from the tree. If it has to be sent on a voyage of more than a week, it should be very carefully packed in charcoal. Even thus, however, the majority of the seeds soon die, and the only satisfactory way of sending seeds to distant countries is to plant them in soil in a Wardian case and allow them to grow on the way.

The germination of the seed is very rapid, and a long tap root is soon produced. The seed should be sown about an inch deep in well prepared soil, in nurseries, or, if preferred, in bamboo pots or baskets. They should be kept shaded and watered, and when the young plants are from 18 in. to 24 in. high they may be planted out. Good results are also obtained by stumping, the plants being allowed to grow about 3 ft. high, then taken up, and the main root cut across about a foot below the ground; but the method of planting out the smaller seedlings is perhaps preferable.

The plant may also be propagated by cuttings. The method employed in the Botanic Gardens has usually been to take cuttings near the ends of the branches, but further back than any of the leaves. Each cutting is about a foot long, and as thick as a lead pencil, and is cut off at both ends by oblique cuts made just below leaf scars. The cuttings are planted in nurseries in wet earth. This method is somewhat precarious: sometimes nearly all the cuttings grow, at other times only a small proportion.

The seedlings, stumps, or cuttings should be planted out during rainy weather in prepared places. Holes should be dug as in the case of cacao, and filled with good soil. A little manure will often be advantageous. The young plants require to be lightly shaded for a time until they are established, and probably for the first two or three years they will grow the better for a certain amount of shade, such as would be given by narrow belts of trees running through the plantation. These belts should be arranged to act as wind belts, as the *Hevea* is easily injured by wind. By the time the trees are about three years old they will have grown up to a height of about 25 ft. or 30 ft. and form their own shade.

Various distances apart have been tried in planting *Hevea.* The younger plantation at Henaratgoda Garden has the trees planted 12 ft. apart. Their average girth is now about 30 in., and they require thinning. It will not do, however, to conclude from this, as is sometimes done, that the trees should be originally planted more than 12 ft. apart. On the contrary, the best results have been obtained by planting 8 or 10 ft. apart each way. The trees thus form their own shade and keep down weeds, and a process of natural selection of the best trees goes on, and the more weakly and dwarfed trees may be gradually thinned out in subsequent years. Another advantage of close planting is that the trees grow up straight without forming many branches low down, and this very greatly facilitates tapping,

Para rubber is a surface-feeding tree, and catch crops should not therefore be grown between the trees, which require all the nourishment that the soil can afford.

The young plants are greedily eaten by cattle, deer, hares, and other animals, and require careful protection for about eighteen months, after which time they are generally tall enough to require but little further protection.

Weeding is also required for the first year or two, but afterwards the trees form a dense shade, under which but few weeds grow.

The comparatively superficial growth of the roots renders manuring easy, and it would probably be found advantageous in poor or sandy soils.

RATE OF GROWTH.—The tree grows very rapidly in height. The original trees, planted at Henaratgoda in 1876, were about 30 ft. high and 14 in. in girth two years later. In 1882 the largest tree was 50 ft. high and 25 in. in girth at a yard from the ground. The girth of this largest tree was taken annually after this, with the following results. It was 30 in. in 1883, 36 in 1884, 43 in 1885, 49 in 1886, 53½ in 1887, 60 in 1888, 65 in 1889, 69¾ in 1890, 73 in 1891, and 79½ in 1893. The girth of the largest tree measured in Brazil by Mr. Cross was 82 in.

The measurements above given are those of the largest tree. More useful data for scientific and practical purposes are obtained by taking the mean girth of all the trees on a considerable area. This was done in January, 1897, on the plantation made at Henaratgoda in 1876. This now consists of 45 trees, about 30 ft. apart. The girth was taken at the height of the eye, about 5 ft. 6 in. above the ground. The largest tree was 7 ft. 5 in., the smallest 2 ft. 1 in. in girth. The mean girth was 4 ft. ½ in.

In the plantations made by the Forest Department near Ratnapura measurements were taken in December, 1894, of the mean girth of trees at 3 ft. from the ground, with the following results:—

At Edangoda	(4 years old),	mean of	100 trees	12·96 in.
Do.	(3 years old),	do.	50 trees	8·75 in.
Do.	(2 years old),	do.	20 trees	4·96 in.
At Yattipowa	(3 years old),	do.	108 trees	9·37 in.
Do.	(3 years old),	do.	108 trees	9·13 in.

The larger measurement at Yattipowa is that of trees on the western slope, the smaller that of trees on the eastern slope. The difference appears to be due to the fact that the latter are exposed to wind.

TAPPING.—The yield of rubber from very young or slender trees is too small to make their tapping worth while, and it is best for many reasons to abstain from tapping a tree until it has reached a girth of two feet. In a large plantation the girth of the trees always varies between wide limits. A few trees may be fit to tap after the sixth year, and in every subsequent year more and more trees will reach the size necessary. In favourable localities the bulk of the trees should be in bearing before the end of the eleventh year. The results of the experiments hitherto made at Henaratgoda go to show that it is inadvisable, having regard to the future, to tap trees of less than two feet in girth, but it is still an open question whether the minimum size of tree for tapping should not be fixed even higher. This however would of course necessitate longer waiting for the return, as the mean rate of increase of girth in trees of this size is only about three inches per annum.

The methods of tapping and of coagulation of the rubber employed by the native collectors in Brazil and elsewhere are rough, wasteful, and inefficient, and there is great room for improvement. Experiments are being made at Henaratgoda to test methods of tapping and coagulation, and their results will form the subject of a subsequent Circular. At present we shall only describe the method which has been employed for some years in the tappings carried on at Henaratgoda.

The requisites for the work are a ¾-in. chisel, a wooden mallet, a number of clean coconut shells, each cut in two so as to form small basins, a knife, and a supply of clay and water with which to form the gutters round the trees.

The tree is first carefully and lightly shaved with the knife from a height of about 6 ft. down to the ground, so as to form a perfectly smooth surface. Only the outermost layers of the bark must be removed in this process, otherwise the tree will be injured. When the shaving is completed, the tree may be polished by hand, or carefully brushed. The great object in view is to obtain a smooth and clean surface, over which the milk can run easily, without becoming contaminated by small particles of bark or other rubbish, as the market value of rubber depends on its cleanliness.

A clay gutter is next made round the tree about six inches above the ground, so arranged as to catch the milk which will trickle down the tree and empty it by two or more spouts into as many clean cocoanut shells placed below. Three shells are sufficient for a tree of 2 ft. 6 in. girth, but larger trees may require four or five. The gutter is made by rolling rather wet clay into a sausage form, between the hands, and then pressing it on to the bark, and forming the channel against the bark by aid of a wet finger. The gutter must not be allowed to dry before the tapping is begun, otherwise the rubber will be contaminated by particles of clay; neither must the gutter be so wet or irregular as to allow the rubber to be dirtied.

Incisions may now be made in the bark with the mallet and chisel, commencing near the top of the cleaned portion. A V-shaped cut is made in two strokes. The object to be aimed at is to make these cuts to such a depth as just not to reach the wood. They should stop in the bark close to the cambium, as the vessels which contain the rubber occur only outside, but very close to, the cambium. If the cambium is not injured the wound rapidly heals, but if the cut penetrates this layer, and enters the wood, the healing of the wound is much slower, and at the same time risk is run of introducing parasitic fungi into the wood, which may cause much damage. Injury to the wood also causes a check to the upward flow of sap, and thus to the growth of the tree. Considerable practice is required before the chisel can be habitually driven in to the exact depth necessary. In dealing with a number of trees it will be found most economical and satisfactory to keep separate coolies for each of the various operations required, as they all need much practice.

As soon as the cut is made the white and very sticky milk commences to flow. A second V-shaped incision should be made about a foot below the first, and others at similar distances down to the gutter at the base of the tree. Another set of incisions may then be made parallel to the first, at about ten or twelve inches from them, and other vertical rows of cuts may be made if there

be sufficient room for them. On a tree of 2 ft. 6 in. in girth, four vertical rows of cuts may be made without serious injury.

As each cut is made the milk flowing from the cut above it should be guided downwards to it along the bark by means of a twig, otherwise the milk is liable to be wasted by dropping to the ground from projecting portions of the bark. The bulk of the milk, especially in large trees or trees which have not been recently tapped, ultimately flows into the cups at the base of the tree. These should be kept covered in such a way as to prevent dust or other rubbish falling into the milk. As soon as the milk ceases to flow into the cups these are removed to a warm place, and in a few hours a cake of solid rubber can be removed from each, which should be kept in a dry place until it has become properly dry all through. The remainder of the milk dries upon the tree in the form of long strings, which are stripped off and rolled into balls. The whole of the rubber when dry is now ready for market. The most suitable times of the day and of the year for tapping are still the subject of experiment. The most satisfactory results have on the whole been obtained by tapping in the drier parts of the two monsoons, *i. e.*, from January to April and in August and September. The tapping should be done on dry days, otherwise it is difficult to prevent dilution of the milk and to dry the rubber.

The tappings may follow one another at intervals of a week for about four to eight weeks. The second tapping gives a much larger yield than the first, and the third and fourth tappings are usually very productive. In a series of experiments made during 1897 on trees of about 2 ft. mean girth, the average yield per tree of the successive weekly tappings was as follows:—

	oz.		oz.
First week ...	·73	Fourth week ...	·80
Second week ...	1·48	Fifth week ...	·67
Third week ...	·97	Sixth week ...	·52
		Total ...	5·17 oz.

YIELD.—The statements as to yield of rubber found in books of travel and popular articles are very unreliable, and experiments are being made to test the whole question of yield. The late Dr. Trimen commenced in 1888 to tap one of the original trees at Henaratgoda, then nearly twelve years old and 50½ in. in girth a yard from the ground.

It was tapped on seven days between January 25 and Frbruary 15, yielding 17¼ oz. of rubber, on six days between July 20 and August 29, yielding 7 oz., and on four days between December 6 and 20, yielding 4½ oz.; a total of 1 lb. 12¾ oz. The same method was followed in alternate years, with results as shown below:—

1888	... 1 lb. 12¾ oz.	1894	... 3 lb. 3 oz.
1890	... 2 lb. 10 oz.	1896	... 3 lb. 0¼oz.
1892	... 2 lb. 13 oz.		
		Total...	13 lb. 7 oz.

The average yield of this tree from the twelfth to the twenty-first year is thus almost 1½ lb. per annum. This result is very good, and if all the trees of the same age yielded as much rubber, the success of the cultivation would be assured. It should, however, be noted that the girth of this tree in 1888 was larger than the mean girth of the whole plantation, as mentioned above, in 1897, and that therefore this yield, if the tree tapped be accepted as a fair sample, represents rather the result to be expected after twenty years, by which time the average girth of the trees should be equal to the girth of this one at the time its tapping was commenced. The trees in question are about 30 ft. apart, *i.e.*, 50 trees to the acre. These data thus indicate a yield of about 90 lb. of rubber per acre in the twentieth year, a result insufficient to make it worth the while of private planters to take up rubber cultivation.

It seemed probable that better results might be obtained by tapping younger and smaller trees more closely planted, and experiments were therefore begun in 1896 on a younger plantation of trees at Henaratgoda. The mean girth in January, 1897, taken at 5 ft. 6 in. from the ground, of 225 of these trees was 2 ft. 4½ in. The figures already given for the average weekly yields represent the mean results of the tapping of 27 trees of a mean girth of 1 ft. 10½ in., six inches less than the mean girth of the whole plantation. From six consecutive weekly tappings of each, a mean yield of 5·17 oz. per tree was obtained. This represents a yield of 97 lb. per acre of 300 trees (12 ft. apart). If the trees tapped had been of the same mean girth as the whole plantation, the yield would probably have been at the rate of about 120 lb. per acre. Further, only six tappings were made, and the trees, after a rest of a few months, would probably have stood three or four more tappings whose yield might have been at the rate of 30 or 40 lb. per acre.

No record, unfortunately, was kept of the date when this plantation was made. It is probably twelve years old at least. The sandy soil at Henaratgoda is unfavourable for Para rubber, and in better soil the trees would probably reach this mean girth in ten years or even less. It would seem, therefore, that if this cultivation is taken up in favourable localities, a yield of about 120 to 140 lb. of rubber per acre may be expected after the tenth year. This estimate is, however, liable to modification by the results of experiments which are still in progress.

COST OF OPENING PLANTATIONS.—The following estimate of the first year's cost of opening a plantation of 300 acres of forest land with rubber was prepared by Mr. F. Lewis. Assistant Conservator of Forests, Colombo:—

	R.
Felling and clearing at R12 per acre ...	3,600
Lining, 10 ft. by 10 ft., at R2 per acre..	600
Holing, at 75 holes per cooly at 40 cents	697
Filling and planting and carrying plants from their nursery to holes, 300 per cooly at 40 cents	175
Draining: 300 ft. of drains per acre at 1 cent per foot run	900
Lines for coolies: 1 shed of 10 rooms of 12 ft. by 10 ft., mud walls, and batticalla roof, at R30 per room ...	300
Roads for inspection, 2 miles ...	160
Plant nursery, including watering ...	150
Weeding, at Re. 1 per acre per month	3,600
Cost of surveying lines round plantation, say	75
Contingencies, such as special work, bridges over streams, or supplying vacancies, &c.	250
Salary of assistant	1,000
Tappal cooly	121
Tools	300
Total..	11,927

This represents an average of R40 per acre. A return of R4,200 is estimated to be obtained

by the sale of timber and firewood from the land cleared. This should suffice to erect the Assistant's bungalow and leave a small margin for contingencies.

To this estimate private planters must add the cost of land and of seed (about R20 per 1,000). These items will probably bring up the total cost for the first year to at least R125 per acre. As a matter of fact, 300 acres is more than can be opened in one year, as the number of seeds required will be at least 160,000, which amounts to nearly two years' crop of the trees in the Botanic Gardens.

For the second, third, and fourth years Mr. Lewis estimates the expenditure on weeding and supplying at R12, R8, and R5, respectively. Assuming that the expenditure in the years following is at the rate of Rs.5 per acre, the cost of the plantation up to and including the tenth year, might work out as follows:—

	R.
Cost of land, 300 acres at R75 ..	22,500
Cost of seed, say	3,600
First year's cost, as above... ...	11,927
Weeding and supplying, second year ..	3,600
Do. third year ...	2,400
Do. fourth year ...	1,500
Do. fifth to tenth years, inclusive	9,000
Salary of assistant, second to tenth years, inclusive	9,000
Tappal cooly and tools, second to tenth years, inclusive	1,250
Total ..	75,777

Allowing interest at the rate of 7 per cent. on all money expended up to to the end of the tenth year, the outlay upon the plantation will amount to at least Rs. 110,000, or Rs. 366·66 per acre.

RETURN.—The value of Para rubber in the London market varies between two and four shillings per lb. according to the quality of the rubber and the state of the market. Of the rubber which has been collected in the Botanic Gardens and sent home for valuation, a large proportion has been valued at almost the highest market price then ruling, but a considerable proportion of the rubber is always of inferior quality, being mixed with particles of dirt. If we estimate the average value of the crop at 2s. per lb., and the yield in the tenth year at 100 lb. only per acre, the return in that year will be £10, or say R150 per acre. The cost of harvesting should not be more than R50 per acre, including carriage to London. This leaves a margin of R100 per acre, representing a return of 27 per cent. upon the original outlay; if 12 per cent. be allowed for contingencies and the usual vicissitudes of a tropical cultivation, there remains still a prospect of a good return on the capital expended.

JOHN C. WILLIS,

Director, Royal Botanic Gardens.

CEYLON PLANTING AND PLANTERS IN HAWAII.

Mr. Hawke, of Orion, who is constantly making trips abroad from Ceylon, returned yesterday, after visiting a part of the world that Ceylon men do not often reach. Leaving Ceylon his intention was to travel *via* China and Japan to America, and so to Europe. China he did not like; but he thought Japan pleasant, and he stayed there two months, going on to San Francisco, *via* Honolulu. On his way to 'Frisco a fellow-passenger on the steamer revealed himself to him as Mr. Caine, formerly of Ceylon, and told him how well he was doing as a coffee-planter in Hawaii. Mr. Hawke was so interested that when he reached 'Frisco he went back to Hawaii, and he now returns from there perfectly enamoured of the place. He says the island is most suitable for Coffee planting, and a good acreage is already under cultivation, growing in rich volcanic soil—a soil that could not be found in Ceylon anywhere. Labor was plentiful, shipping facilities excellent, and Hawaiian Coffee was fetching 80s. a cwt. He secured 400 acres of land at an elevation of 2,000 ft. from the Provisional Government, and he returned at once to Ceylon to make arrangements to sell Orion estate and settle down in the Sandwich Isles to plant up his new property. Almost all the Coffee there is Arabian.—"Local Times," Feb. 19.

LIBERIAN COFFEE.

ITS PROSPECTS IN THE MALAY PENINSULA.

[*By a Former Ceylon Planter.*]

Selangor is undoubtedly the leading State as far as coffee is concerned. Two years ago, when the price of Liberian coffee was between $45 and $47, the prospects of Liberian coffee certainly looked bright, and the Selangor Government gave out thousands of small blocks of land to Javanese, who looked after their coffee tolerably well during the high prices; but a look-out of a railway carriage window between Klang and Kwala Lumpur now will show what a terrible change has come about with low prices. The land is fast becoming jungle again, and disease is being spread over the country by this uncared-for coffee; and this is not the only evil caused by giving out this land to the Javanese, for the lands given out were small, narrow blocks, all along the best roads and railways in the country, so spoiling the frontage of a vast extent of land behind, for no planter cares to take up land behind these seedbeds of disease and nurseries of weeds.

Another evil is that the Javanese, who were about the best labour force in the country, have become a lazy lot of good-for-nothing impudent men, and it is the geneal opinion amongst the planters that this labour force is lost to the country.

BAD TIMES AHEAD.

It is my opinion that we are about to face some years of very bad times, not only in short prices, but in short labour forces, and it will only be some of the best estates that will pull through the crisis: what chance will estates have that are not able to give three piculs per acre without manuring; and again what chance will others have that average 30 per cent. on the sick list? An answer to this will be to go in for new products; but, with bad times, where is the money to come from? besides, few of the old places are fit for new products.

HOURS OF WORK ON AN ESTATE.

In the face of this, it behoves planters to go in for every economy that is practicable, and the most practicable economy that I know of is the changing of the working hours from 6 a.m. to 2 p.m. to from 6 a.m. to 10-30 a.m., and again in the evening from 1-30 p.m. to 5-30 p.m. giving the coolies, conductors, and superintendents three hours' rest in the heat of the day. It is a well-known fact that, when the superintendent goes home for breakfast, the coolies

sit down under the coffee trees; then, why not have them in their lines, where they can also get a good meal and go out fresh in the cool of the evening. I positively state now that I have proved that I can get 30 per cent more out of my labour in this way; and I ask any superintendent whether he feels very fit to look after his work in a burning sun after a a heavy meal and "perhaps" a bottle of beer. He wants two hours; rest at least, and so does any other man, and, what is more, most of them take it.

This question was brought before the S. P. A. a few days ago, and it required the casting vote of the Chairman to decide it against the motion for working morning and evening. Many men who then voted against it stated that they knew it was the best thing to do. One man said his lines were too far away for the men to go home (his lines should be near his store, when men can go home after measuring their first box of *palam*). He was a cricketer. Another man said rain came on in the evening, therefore he would vote against it. He was a golfer. Another said his coolies would not turn out again. He was a tennis player, and so a good motion was lost, a motion that would save the proprietors of estates 30 per cent on the labour expenditure and half their bill for doctors and medicine.

In the face of the labour difficulty individual estates cannot do it; but if two thirds of the estates agreed to do it, it could be done, and some of the others might be made to do it. Once a week is quite enough for a man to get away to his club and his golf, and any man who has not the interest of the estate at heart enough to make him walk round it in the evenings, whether his coolies are working or not, is not the man I used to know in Ceylon.

THE CURING OF LIBERIAN COFFEE.

The next great difficulty we have to face is the bad state our coffee arrives in the London market. I could not believe that the samples I saw were Straits Liberian coffee; and I am positive that the cause was mixing a lot of coffee from different estates together, and sending it home in sacks instead of in barrels. No matter how good and well-dried a lot of, say, 50 tons may be, if it is mixed with even 10 tons of imperfectly dried coffee, mildew will set in and spoil the lot before it reaches the London market; and this would happen even were it in barrels, so that uniform dryness must be insisted on.

Sizing of Coffee.—This is one of the great objections to our coffee, as it cannot be evenly roasted unless it is of equal size. This seems a very easy matter to settle, but it must be done on a large scale, and most estates are so small that they have not a chance of being able to do it on their own estates.

A CENTRAL CURING ESTABLISHMENT.

The remedy for these two predominating evils is a curing establishment in Klang. My own idea is an establishment owned by the planters of Selangor and worked by a directorate appointed by the S. P. A. At first I thought that Kwala Klang was the best place, but I have changed my mind on that question, on account of the difficulty of getting women and children at the Kwala, when they are very plentiful in and about the present town of Klang.

If this establishment is formed in Klang—whether it be by the Planters or by private enterprise—it must be on a large scale, if it gets ⅔ of the support of the acreage of coffee now planted in this State. The mill will make large profits, as they will get high prices for their coffee in London, and buy at the ruling price of the market here.

They will be able to dry their coffee to a uniform dryness, size their coffee to different sizes, and send each sort to the most suitable market for it, and pack all in barrels or tea boxes instead of in bags.

"Is Liberian Coffee any good, and will it ever bring a fair price in the American and London markets, and what is the reason that it is at such a low price in comparison to other coffees?"

The low price in comparison to other coffees is the most serious question of all, for other countries are getting a good paying price, and will go on increasing their production, whereas if we were all at a low price, it would be only the waiting for the survival of the fittest to get a good price again.

As to whether Liberian coffee is any good or not, I must say I trust to my own palate, and to the palates of thousands who have declared it to be as good as any other coffee; and I beleive that, if we can only produce it for sale in the London market as it leaves here, it will fetch a price in proportion to what it is worth. I once sent a tin of Johore Liberian Coffee to Britain, and most of the people in our own country have tasted it and pronounced it excellent. I saw and drank some of that same coffee at home two years afterwards, and it looked as glossy and as sound as the day it left the store, and tasted equally as well as it looked—very different to the dull mouldy-looking, half-decayed coffee I saw with London merchants as samples of Straits Liberian. I sent that sample home in a Java sugar tin soldered down.

THE CRISIS.

I have hopes that the best estates will pull through this crisis: but I should not like to raise the hopes of men in this Peninsula who have poor bad estates, some of them estates that I reported on years ago before coffee ever reached $35 and recommended the abandonment of.

Those very estates kept on until coffee reached $47, and even then they did not pay. The owners of those estates ought to know what to do now, for coffee is not likely to reach $47 again. I only wish it would.

The fact of it is that any estate that requires manure to produce an average of 3½ piculs per acre all over should be abandoned, unless the land is good for other products such as Rubber; but nine tenth of them are not fit to plant Para Rubber in, and more than half of them are good for nothing.

It is not until coffee comes into bearing that the real brains of a manager are tested. You often hear a man say on passing an estate: this is a fine little estate, and it is well managed, never thinking for one moment what it cost. Any imbecile can open up a small estate if he spends enough money on it; the good man is the one who can open up a place as well as it can be done, and at as small a cost as any other man can do it. I know of estates being opened up in this State at such a cost that, if coffee were to go to $40 per picul and remain there, they would never pay. As a rule, the unfortunate men who supply the money do not question the acreage opened up and the cost of it. If they did it would be better for themselves and a man might have a chance of making a cooly give a day's work for a day's pay.

For men who have good rich young estates it is the time to make all improvements possible, above all things to get a day's work for a day's pay and to try to send a better sample to the European market.

NIL DISPERANDUM.

PREPARATION OF TANNIN EXTRACTS.

Under the name of tannin or tannic acid are included a number of different but closely allied substances widely distributed throughout the vegetable kingdom, which all agree in this one particular that they are greedily absorbed by the raw hide of animals, forming with it leather. They are contained in abundance in galls; in certain fruit, such as that of *Terminalia Chebula*, *T. Citrina*, *T. Bellerica*, *Phyllanthus Emblica*, etc.; in the leaves of some trees, such as *Sumach* and *Anogeissus latifolia*; in the wood of most trees possessing a durable heart-wood, such as oaks, chestnuts, Acacias, sâl, etc.; and last, but not least, in the bark of many trees and bushes, such as oaks, babul, sâl, *Terminalia tomemtosa*, *Soymida febrifuga*, spruce, *Pinus longifolia*, *Cassia auriculata*, etc.

Galls, fruit and leaves are easily exportable in a dry condition, but wood and bark are both bulky articles to transport over long distances. Moreover, in Europe the old system of tanning by stratifying hides alternately with layers of coarsely ground

bark, a system which occupied from one to two years before the leather was ready, has been rapidly giving place to tanning with liquid extracts, which have the great advantage of penetrating the hides quickly and shortening the process down to a few weeks. The question, therefore, is to turn to account the enormous quantities of bark and wood which at present go to pure waste in our Indian forests and to convert them into tannin extracts for export to Europe and even for use in the country. Under the old system of tanning, Europe had in her cold climate an advantage which forbade all Indian competition in the preparation of leather. The native system of sewing each hide into a bag and filling it with tan, besides not giving the hide enough time to absorb the tannin thoroughly is much too slow, cumbrous and space-demanding to have ever had any chance of producing an article fit to compete against the European one. But now that the use of liquid extracts has shortened the process of tanning so considerably, it seems absurd that India should export raw hides and not leather.

Professor Henry of the Nancy Forest School has shown, as the result of careful and repeated analyses, that in the common European oak the bark contains most tannin, heartwood coming next, with the sapwood a very bad third—so bad, indeed, that it would be an advantage if the sapwood could be got rid of by some cheap process when preparing the extract. The bark of the root stock is richest in tannin, the butt-end of the trunk being only a little behind it, while at the top of the trunk the bark contains hardly more tannin than the outer layers of heartwood. As regards the heartwood, the richest portion is that in the butt-end; moreover, the quantity of tannin diminishes from outside towards the centre of the tree. The heartwood of the larger branches contains more tannin than that of the top of the trunk. The very small branches and twigs, being nearly all bark, contain as much as the heartwood of the base of the trunk. The wood of coppice-grown oak is richer in tannin than that of high-forest grown oak, and generally the broader the annual rings are, the larger is the quantity of tannin. Also oak grown on limestone soils yields more tannin than oak from a soil deficient in limestone.

Another interesting result of Professor Henry's experiments shows that the tannin in the bark and sapwood deteriorates and disappears much more rapidly than that in the heartwood; in the first two it exists in the form of amorphous granules, which, in contact with water, first of all break up into minute globules and form an opaque mass, and finally become completely dissolved, whereas in the heartwood the tannin is found as a homogeneous deposit impregnating the membranes not only of the medullary rays, but also of all the fibrous tissues, and in this condition is better preserved. Even fossil oak wood contains some tannin, but fungi destroy the tannin completely, wood suffering from red rot containing no tannin at all.

It is very desirable to have similar analysis made of our Indian trees, which contain sufficient tannin for the leather industry, but in the meantime we may presume that what M. Henry has found out for the common European oak is more or less true of all trees.

I will now proceed to describe, first, the process of extraction treated in a general manner, and then briefly some of the more usual processes employed.

Method of Extraction.

I.—Generalities.

Whatever the special method employed, the following is the order of the processes to be gone through:—

(1.) The wood or bark must be chopped up or shaved fine transverse to the grain, so that the fibres and vessels may be cut across.

(2.) The chips or shavings, as the case may be, must be macerated or subjected to the action of hot-water or steam, so as to yield an infusion or decoction. As all natural waters contain lime, and lime diminishes the yield of tannin, either distilled water must be used (expensive) or the water should be mixed with a small quantity of sulphuric or oxalic acid, in order that the lime may be precipitated, excess of acid being afterwards got rid of by the addition of an alkali in the form of a carbonate or caustic.

(3.) The extract should next be cleared of the colouring pectosic and other matters in suspension. This is done either by treating with blood or any other albuminous substance, such as the coagulum of casein (blood has hitherto given the best results), or by filtering through animal charcoal (very wasteful, as the charcoal absorbs a large proportion of the tannin), or by the addition of metallic salts, or by centrifugal force (on the same principle as that of the cream separator). Each and every system necessarily involves some loss of tannin.

(4.) Mechanical filtration, preceded, if necessary, by decantation.

(5.) Concentration to the degree required, if a liquid is wanted, or reduction to an earthy form like cutch. In either case the pneumatic process should be used.

II.—Special Processes.

It will suffice to describe here five processes, all of which may be easily employed in India and require no expensive or special plant that cannot be made in the country itself.

1. Gondolo's Process.

The chips or shavings are macerated, with or without the application of heat, in water, to which sulphuric acid has been added at the rate of 6 grammes to a litre. The extraction of the tannin being complete, the infusion is treated with sodium carbonate, 1 gramme for every 6 grammes of acid used. A precipitate forms which is got rid of by decantation. The extract thus obtained is not highly coloured; but in case a lighter-coloured and perfectly limpid fluid is required, clarification must be undertaken with a coagulating substance. This latter must be mixed with the infusion at a temperature not exceeding 45° C. The temperature should then be quickly raised, the mixture being constantly and energetically stirred. Care must, however, be taken not to allow the temperature to exceed that necessary for coagulation, otherwise the albumen will remain in suspension and fail to absorb the colouring matters. As soon as coagulation is complete, the liquid must be allowed to cool. After a rest of about an hour it is drawn off and filtered and then concentrated to 30 to 45° Baumé, according to requirements. The extract is very rich in tannin, is extremely soluble, and is of the colour of honey.

2. Another Process.

When the wood or bark used is of a very deep colour, a slightly different process has to be employed. Macerate in water, adding at any time 20 grms. blood for every kilog. of bark and wood and keeping the temperature well below 80° C. When the maceration is complete, the temperature of the liquid is to be brought down to about 55°C., and 1 grm. of carbonate of soda or of another alkaline salt and 15 grms. of blood added to every litre of the liquid. The temperature should now be raised, whilst constantly stirring and gradually adding 6 decigrammes of sulphuric acid for every litre of the infusion. The result is that a flocculent mass at once forms in the liquid, consisting of lime salts and colouring matters with the albumen.

Cool, decant and concentrate as before.

3. A Third Process.

This is a slight modification of the preceding, a sulphite or bisulphite being substituted for the sulphuric acid and added *during*, not *after*, the maceration. The salt is decomposed, tannates and free sulphurous acid being produced, the latter of which acts as a decoloriser, becoming thereby changed into sulphuric acid, which precipitates the lime salts in the water and prevents their alkaline action on the tannin. The tannates or free sulphite or bisulphite, as the case may be, that still remain unused in the liquor, are got rid of by the addition of sufficient sulphuric

cid. Although up to this no blood has been used, he extract is less highly coloured than that obained by the immediately preceding method.

To decolorise still further, proceed to coagulate with blood, and decant, filter and concentrate as before. The liquor thus obtained is of the colour of pale honey, and is so limpid that it enters the thickest hide rapidly and converts it into leather in the course of a few days.

4. Villon's Process.

For this process a special, but very simple apparatus is required. A large square copper or brass vessel about 7 feet high and 3 feet side, divided by the removable cross-plates into three compartments, a false bottom of very stout wire gauze, which can be pulled up by means of four rods when the vessel is to be emptied.

Each of the plates (E.F., GH) has 250 circular performations about two-fifths of an inch in diameter.

TT is a tube of about 3 inches bore and about 6 feet long, which passes through the centre of both moveable plates and is held in place by the lower plate at such a height that its lower extremity is only a few inches above the bottom of the vessel, while the upper extremity projects a little beyond the upper plate.

PPP is a pipe through which steam is introduced into the lowest compartment of the vessel, while t_1 is a tap through which fresh water can be let into the same compartment, and t_2 another tap through which that compartment can be emptied.

The height of the lowest compartment is about 28 nches, that of the highest about 6 inches.

To set the apparatus in operation, the middle compartment is filled tight with the chips or shavings of which the tannin is to be extracted, and distilled water is introduced into the lowest compartment up to a few inches below the upper level of the pipe PP. Steam is now let in. The water soon boils and, under compression of the steam in the space above it, is forced up through the central tube TT into the highest compartment, whence it enters the middle one below and finds its way back into the lowest compartment carrying away with it in solution extractive matter from the chips or shavings. In this way a continuous circulation of the water is set up, and in about 6 hours the extraction is complete.

By working a battery of several such vessels so connected with one another that the extract from the first, when the shavings have been sufficiently exhausted, can be turned on, through a tube furnished with a tap, from the tube KK into the uppermost chamber of the second vessel, and so on up to the last vessel, a liquor of great strength is at once obtained which requires very little concentration.

The advantages of this system are: (1) that the strongest possible extract is obtained with a given limited quantity of water,* so that the labour and expense of concentration is very appreciably diminished; (2) that the liquor is light-coloured and fairly clear, and hardly requires special bleaching if the wood used does not contain a dark dye; (3) that it exhausts the wood of all its tannin; and (4) that the extract contains less gallic acid and gallate of tannin than that obtained by any other process. Moreover, as no chemicals are required and the entire process is within the comprehension of the lowest intelligence, the method is specially adapted for employment in our Indian forests, however remote. It would suit cutch manufacture perfectly.

The remark may here be made that there seems no reason why the vessel as well as the partitions should not be of wood, which would not only be much cheaper than metal, but also retain heat better and have no injurious effect on the tannin. Even the wire gauze sieve could be replaced by a wooden trellis frame covered over first with bamboo matting and then with stout cotton drill, which would filter as effectively as the finest wire-gauze.

5. Luc's Process.

M. Luc owns several large tanneries, one of which is at Nancy. He employs only oak, not only because oak liquor produces firmer leather and is more easily rendered lighter coloured than chestnut extract, but also because the tree is more widely distributed in France and therefore more easily procured. He uses only root-stocks, butt-ends and branches, *i.e.*, such pieces as are useless for timber; but he rejects everything that measures less than 4 inches in diameter at the small end. His wood costs him about 22½ shillings per 100 stacked cubic feet delivered at the tannery.

At first M. Luc used to have the wood barked on the express advice of the chemist who invented the system employed by him, but he found the cost of barking very heavy and gave it up. Since doing so, the liquor he obtains is richer in tannin and is more easily made light coloured.

The wood is reduced to shavings less than one-twelfth of an inch thick. The decoction is effected in wooden vats, each taking nearly 6,200 lb. of chips, with boiling water which is kept in constant circulations. The vats are connected together so that the liquor from one passes into another holding fresher chips. When the liquor marks 25° Baumé it is run into a large wooden barrel containing a serpentine tube, through which cold water is constantly running. As soon as the temperature of the liquor has fallen to 30° to 35°C., blood is added with a little sulphuric acid. The temperature is then raised to 60°—65°C. to coagulate the albumen of the blood. By this clarification the density of the liquor is reduced to 2° Baumé. Concentration is now effected by the ordinary pneumatic process until the areometer marks 20° to 25°.

This extract is not used by itself, but is only added gradually to strengthen the ordinary tan liquor in which the hides are soaking.

The gallon weighs 12 lb. and sells at 23½d. Even at this rate the profits are very high, and M. Luc is driving a roaring business.

The exhausted chips are used as fuel for generating steam for the machinery and other purpose, special grates being used which do away with the necessity of previously drying the chips.

III. Concluding Remarks.

In India we could employ not only wood, but also barks for the preparation of tanning extracts. One of the functions of the Forest School at Dehra Dun should be to anylyse for tannins the bark and wood of all our likely species. The system of effecting analyses with the help of students, which was in force during Dr. Warth's tenure of the Instructorship of Natural Sciences, should be resumed, especially as there is now an Instructor to spare during the open season. To assist the Instructor only the more intelligent students, who have shown a bent for chemistry, would be selected.

It will be remembered that Captain Wood, late Conservator of Forests of the Oudh Circle, made a solid extract of sâl bark which he tried to get accepted at Cawnpore and by tanners in England. The experiment was not successful owing, no doubt, to the extract containing colouring matters and other impurities, and probably also to being prepared at too high a temperature; but the venture certainly deserves being repeated, not so much in order to make the preparation of the extract a departmental business, as to attract and invite to it private enterprise.—*Indian Forester.*

* When chestnut wood, which contains 5 to 6 per cent of its weight of tannin, is used, the liquor obtained by decoction in a single vessel marks 5°-6° Baumé and contains 5 per cent of tannin.

The Codlin-Moth.—These orchardists who have but few Apples this year will have their compensation next year in the greatly lessened numbers of the Codlin-moth. It has been remarked that in orchards which had few Apples in any one year, the fruits were not greatly injured the following year, even when no measures were taken to prevent an attack. This was doubtless owing to the moth finding few or no fruit in which to develop the maggot.—*Gardeners' Chronicle.*

the calyx or husk from the seed ball. Cook the husks as you would any fruit until done and strain the juice out for jelly as from any other fruit; in fact treating it as you would any jelly. It jells very easily and makes the most beautiful jelly ever seen, we all think. The residue, after straining out the juice may be put through a colander or vegetable sieve and made into marmalade or sauce, or the entire product may be so used without making jelly, and will be found excellent; or it may be cooked and canned as well as any other fruit and used in any way. Pies, short-cake and as a spread for the youngsters' school lunch are examples of its uses. In looks and taste it is almost identical with cranberries, only not requiring so much sugar and cooking, and lacking the bitter taste sometimes found in cranberries. A pleasant drink may be made from the leaves by boiling them in clear water. Pour this off, sweeten it and boil down until quite rich and when cool add a few spoonfuls to a glass of water. It is very refreshing. This juice from the leaves may be also made into jelly if one wishes, and the leaves may be eaten as greens. It is remarkably prolific and can be put to so many uses that it may well be considered one of the most useful plants we can grow in Florida. It is an annual and of course must be planted every year as with cabbage or potatoes, but it is tenacious of life and easily grown. We planted ours six by six feet apart last spring and now it is crowding together and presents a solid mass of green, red and yellow all over the patch, and fully eight feet high from the ground. The 150 plants will yield many bushels of fruit, and helps mightily in our living for a year, for I see evidences of store of jelly and canned goods to be made from it.

Another year I shall plant further apart, eight by eight, I think, and this you must remember is on a sand hill in the lake region of Polk county; on richer soil it spreads out even more.

W. S. PRESTON,

Auburndale, Fla.

NORTH NYASSA NEWS.

Plumbago (black-lead) has been discovered in the southern portion of this district. It is in the solid form and of excellent quality. Specimens of it were brought in to Deep Bay by the natives who use it for colouring their earthenware pots.

Game is more plentiful on the Konde plains this year than it has been since rinderpest visited the district in 1892. Amongst the game, large herds of Roan Antelope are to be met with, apparently having been forced to leave the hills through scarcity of water.

An antelope which may prove to be a new one has recently been discovered near here. It is very small with horns only about 1½ inches long. The colour of the buck is very similar to that of the otter.—*B. C. Africa Gazette*, Nov. 29.

AN INVENTION BY A CEYLON PLANTER.

Mr. A. K. Leitch, of Great Valley, Deltota, has patented an invention which is "an improvement in Lock-Nuts," and relates to improvements in lock-nuts for the purpose of rigidly bolting together various parts of materials employed in mechanical constructions, and to prevent any nut so employed becoming loose on the bolt. "The invention consists of making a grove in the bolt, deep enough to take a flexible pin or wire below the level of the threads of the screw, and at the end of the grove a hole is drilled in the bolt so as to allow of the bent end or head of the pin being passed into it, and so secured. A pin is then taken, bent at right angles at one end and it is laid in the groove with the bent portion or head in the hole in the bolt, the bolt being passed through the bolt holes of the pieces to be connected together, and is then screwed on the nut (which may have any number of grooves on the face of it, so as to allow of the bending over of the other or tail end of the pin or wire without disturbing the level of the face, and so making the hold more secure and the tail end of the pin is bent over in one of the groves cut in the face of the nut after the said nut has been thoroughly tightened up. Although only six grooves are usually cut in the face of the nut there may be any number where there is room for radiating from the centre for the end of the pin to be bent at right angles, over, depressed, or clamped into either of aforesaid grooves. It will be seen by this method that, after the pin has been fixed, it is impossible for the nut to become loose from the bolt and bolt head, owing to the nut being fixed to the bolt by the action of clinching the pin described.

CEYLON *Vs.* COCHIN COCONUT OIL—AN OLD COLOMBO MERCHANT.

NOTES FROM HOME.

(By a very old Colonist)

By the time you receive this it will be nearly two months since your most interesting papers containing what we may call.

THE COCONUT OIL QUESTION

came to hand and again the *Tropical Agriculturist* with much more on the same subject. Had it been possible I might have written you a short summing-up of the array of facts your circulated enquiries have elicited. In fact the question has been well threshed out and was well put in a nutshell by your correspondent W.B.L., an authority of experience.

Your

MEMOIR OF C. SHAND

is an admirable one, and the man himself an eminent type of the Pioneers you wish to record. We were known to each other from the earliest days. He was my neighbour (25 miles away) in Sabaragamuwa. As a merchant no one ever came to Ceylon with so thorough a mercantile training in the thick of Liverpool business. I last saw him at his London office on my arrival home at the end of 1870. I find he is two years my junior. N.B.—Mr. Shand did not marry the daughter of plain Mr. Symons, but of Colonel Symons, R.A., then Commandant of Artillery in Ceylon.

COCONUTS AGAIN.

I think it must be conceded that the climate of Southern India is hotter and drier than Ceylon (I found it so)—therefore more favorable for nuts and copra. Pruning away old fruit stalks does not bleed the trees, but is practised, as our rose cultivators here cut off the bud or seed vessel after the flower has gone off by which the blooms are increased. If coconut planters will take the lesson, they may gain for Ceylon oil a good reputation in Europe. Interior oil there will always be as of coffee and probably now of tea. By adopting new methods, coffee (Ceylon) was raised from the "elephant trod" of the thirties to the splendid samples which ruled the English market in late years. The natives greatly improved the merchantable condition of their coffee following the methods of English planters to some extent; and they may do so in copra and oil.

WYNAAD PLANTERS' ASSOCIATION: PROGRESS OF TEA PLANTING.

We have received copy of proceedings of the annual general meeting held on January 5th, when the annual report for 1897, was read. Among other things it noticed work done by United P.A.S.I. as to finances:—

A Reserve Fund of R8,825.12.0 was established, of which R5,000/ has been placed at deposit with Messrs. Arbuthnot & Co., and the rest kept in hand to meet payments voted, if certain conditions are fulfilled. One of these payments is R2,000/ towards the introduction of Lady Birds to Combat Scale pests, and I think this payment will have to be made, as the Govt. of Madras have agreed to pay half the cost, and the Lower Palneys are also prepared to pay up handsomely. Another payment (was R2,000/ per annum towards the expense of an Agricultural Chemist, if District Associations and the various Governments concerned will also contribute. I think it doubtful if this payment will be made, as I am informed the Mysore Govt. will engage a chemist and collect subscriptions for Mysore planters, and that the only other district which will contribute any considerable sum is the Nilgiris, which promises R2,100/ per annum. The Shevaroys may also subscribe, but two districts will hardly provide enough money to start such an expensive scheme. The third payment is R1,000/ towards the expenses of Mr. Cameron, if the Mysore Govt. will lend his services for the improvement of the strain of coffee, I do not know if this payment will be required or not. The other important resolutions passed were in favour of reopening the Mints; of an export tax on Bones.

But we are told as to the above that the Wynaad Association approved of the agitation for the reopening of the Mints, but disapproved of the schemes for leaf disease remedies and the employment of an agricultural chemist, and has not subscribed to the introduction of Lady Birds to combat Scale pests.

From the general remarks we learn that,—

Tea continues to be extended, and will shortly require an increased supply of labour, which it should not be difficult to get. Arabica crops are very short this year, as is the case in most parts of Southern India. Prospects for next year are, however, very good, there being every indication of a plentiful show of spike. Liberian coffee continues much as last year, and is not likely to be extended largely until good crops are realised. One of the greatest dangers to the future prosperity of the district lies in the action of Government in forcing up exchange, while our competitors in both tea and coffee enjoy an unprecedentedly low rate of exchange. With Brazil exchange at the equivalent of 7 per rupee and consequently Brazil coffee in superabundance at 25s/ to 30s/ a cwt. we may consider ourselves lucky that our prices for Arabica coffee have fallen only from 100s/ to 80s/, although Liberian has gone down from 75s/ to 45s/. Any further fall in price, coupled with high exchange, would render the cultivation of Arabica unprofitable. It is difficult to regard with equanimity the adherence of Government to a policy, which threatens to ruin our industry, and the whole export trade of India. Another very great danger to our prosperity is the insufficient grant for the upkeep of roads.

The election of office-bearers resulted in Mr. R. K. Walker being elected Chairman for the coming year, and Mr. de Fonblanque, Hony. Secretary.

NAHAVILLE ESTATE COMPANY, LIMITED.

The annual general meeting of shareholders of the Nahaville Estates Company, Limited, was held this afternoon at No. 14, Queen Street, Colombo, the registered office of the Company.

Mr. A. Orchard presided, and the others present were: Messrs. J. M. Mason, William Anderson, Gordon Pyper, J. Paterson, J. Lewis Gordon, and Mr. T. S. Grigson by his attorney Mr. W. Anderson, Mr. A. F. Souter by his attorney Mr. F. W. Waldock, and Mr. W. H. Walker by his proxy, held by Mr. J. Paterson.

The fourth annual report of the Directors was laid on the table:—

The Directors beg to submit their Fourth Annual Report together with a Statement of Accounts for the year ended 30th September, 1897.

It is with regret that they find themselves unable to recommend the payment of a dividend in connection with the past season's work.

The crops, though much larger in quantity than those of the preceding season, have, owing to the fall in prices realised very little more money, and as the expenditure has been in proportion to the amount of produce harvested, the net income shows a material falling-off.

With a diminished income the Directors have had to provide during the year for the upkeep of a large area of land which has not reached the profit-yielding stage, and there has been some outlay in connection with the Factory now being erected on Nahavilla Estate, and a considerable increase in the Coast Advance Account.

The latter has been a source of anxiety throughout the year, and since the beginning of the current season there has been trouble with the labour on Galella, which it is feared will end in a portion of the outstandings on that Estate having to be written off.

The remaining advances are believed to be good and recoverable.

A Factory is in course of erection on Nahavilla Estate.

Messrs. Mason and Orchard visited the Uva properties in company lately, and were favourably impressed with their appearance and prospects.

The following is a definition of the Company's property as on the 30th September last:—

	Navilla.	Ury.	Mahapahagalla.	Galella.	Total.
Tea in full bearing	..273	209	195	313	990
Do. partial bearing	.. 61	—	—	—	61
Do. not in bearing and in course of planting..	.. —	319	57	3	379
Coffee	..120	48	—	—	168
Forest	.. 46	66	5	72	189
Cinchona, Grass, Fuel, Trees, Patna, &c.	..101	121	66	244½	532½
	601	763	323	632½	2,319½

Mr. J. M. Mason retires by rotation from the Board of Directors, but is eligible for re-election.
—By order, GEORGE STEUART & Co.,
Colombo, 19th Jan. 1898. Agents and Secretaries.

The adoption of the report was proposed by the CHAIRMAN, and was seconded by Mr. GORDON PYPER. The motion was carried.

It was proposed by Mr J. PATERSON and seconded by Mr. Mason, that Mr. J. Guthrie be reappointed as Auditor for the current year. The motion was carried.

It was proposed by Mr. WALDOCK and seconded by Mr. PATERSON, that Mr. Mason who retired from the Board of Directors by rotation, be re-elected as Director. The motion was carried.

A sum of R1,500 was voted to remunerate the Directors for their services during the past year, but the members of the board present at the meeting intimated that it would be

SCIENTIFIC MANURING.

One does not expect to find agricultural information, especially on that branch of agriculture which deals with the latest advances in the scientific treatment of the soil, in an ecclesiastical journal; but the *Guardian*, one of the best edited and most influential organs of the Anglican Church, claims to be a religious paper in other than the ordinarily accepted sense. It is not entirely devoted to the discussion of religious questions. Its editorial notes, discussing the principal political topics of the week, are singularly well-written and judicial; and Mr. Gladstone has been quoted as having declared them to be among the best-written and fairest in current literature, though they are of late years decidedly Unionist in their tendency. The column articles are somewhat heavier, but are also well worth reading; and among these, at frequent intervals, is a paper of interest to the farmer, and presumably also to the country-clergyman, whose income still to a great extent depends on the soil and its treatment. We have been interested by recent articles, which present the details of experiments with manure, after the most approved scientific fashion, by comparing the yield of unmanured plots with manured; experiments in poultry-keeping with details of cost; in fattening cattle and pigs for the market:—all worked out with business-like accuracy, and generally tending to show how a limited income may be helped by small industries which are at once interesting and conducive to health. In one of these issues, we have noted a very instructive article, dealing with recent discussions on manuring which has a bearing on much that is going on among ourselves, in view of the growing interest in fertilizing substances, and their projected application to the soil on scientific principles. Probably, the enterprise of Messrs. Freudenberg & Co. and Messrs. Baur & Co. is not wholly unconnected with the movement in Germany to which the article refers. For, two topics to which special attention is drawn, with a preliminary lament at the paucity of agriculturists who read what is intended for their benefit, are first the inquiry by two eminent German Professors into the problem of combining ordinary farmyard manure with certain artificial manures—"notably those containing nitrogen in the form of nitrate of soda;" and second the success attending the use of basic slag to bott wheat and clover in some of the farms of the Midlands. The topics are not wholly new; but we are not sure that we have ever seen the German conclusions so explicitly set forth, as going counter to accepted theories and practice. Not only is it claimed that the mixture of artificial and farmyard manures, as above described, leads to no improvement in the constituents but it is distinctly asserted that the combination detracts from the value of the separate manures! The theory is that the "denitrifying organisms" in the farmyard manure reduce the nitric acid to its elements of free nitrogen and oxygen, and so render it incapable of serving as plant food. Superphosphate and kainit are said to increase this deleterious action, by giving vitality and power to the denitrifying organisms. Professor Somerville of the Durham College of Science has found support for these conclusions in the experiments he had directed in the North of England, where, in certain instances, the crop of turnips was actually diminished in fields which had a dressing of farm manure and superphosphates! We may note in this connection that in papers on scientific manuring recently circulated locally, there is a strong recommendation that kainit, which is condemned above for mixing purposes, should be added to cattle or stable manure or daily sprinkled over heaps, as it "has been proved to have the property, in a certain degree, of preventing loss of nitrogen from cattle manure"! We know that on one estate at least on which Messrs. Freudenberg's manures are having a trial, kainit has been sprinkled over the usual combination of cattle manure and bones dug into the soil at the root of coconut trees; and we hope to receive information, in due course, of any difference that may be observed, in the appearance of the trees and in crop, between the fields thus treated, and those to which kainit has not been so applied.

The German experiments go counter to more than the mixture of artificial and natural manures. They are said to establish —the experiments were limited to pots, —that horse and cow dung added to the soil give a smaller crop than the unaided soil, and a much smaller crop than the soil assisted only with a dose of nitrate of soda containing the same amount of nitrogen as the dung. The writer in the *Guardian*, as we think rightly, refuses to accept this result as justifying distrust in the universal experience and belief of farmers in favour of the use of the droppings of animals to enrich the soil. The material used may have been too fresh, it may have been used in too large a quantity, or in its decomposition it may have had an untoward effect on the mechanical condition of the soil; but it is important to note that various practical English farmers insist that dung does act injuriously, when it is used upon grass ploughed up for an oat crop. In this instance, the article under notice suggests that the injury is probably due, not to "denitrification," but to the ground "being mechanically kept too open to allow the proper development of the roots, and retention of moisture"—oats requiring a good supply of moisture at every stage. What is of importance is, the knowledge which these experiments supply, that the best of manures, artificial and natural, may not only do no good, but be positively hurtful, under certain conditions of soil or climate. It is only corelative to the experience in human beings, that what is food to one may be poison to another, and what is nourishing at one time may be fatally injurious at another. The conditions must be ascertained by experience, supplemented by science.

In regard to the use of basic slag—which is, we believe, also known as Thomas's Phosphate Powder, and which is obtained from iron ores rich in phosphorus, by the extraction of phosphoric acid and the simultaneous addition of lime—its success with wheat and clover has given it an immense reputation, and it is claimed that 50 bushels of wheat per acre, and two tons of clover are the certain result of the application of 6 cwt of basic slag, costing about 12s. in all. The *Guardian* writer states that inquiry has shown that these results have been obtained where t e wheat itself, or the preceding crop, had received full dressings of common manure; while the clover was grown on certain special soils. Without in any way questioning the value of basic slag, whose richness in phosphoric acid, combined with free lime and

magnesia, makes it often an excellent manure, the writer under review refuses to admit that it has been proved to be a universal panacea. Experiment is the sole and final test to which all suggestions, whether emanating from a "scientific" or a "practical" source, must be referred; and in every case of "sovereign remedies" a trial is possible, by manuring a strip of a field, and leaving an adjoining strip unmanured. A few months will enable a comparison to be made by the eye and also by the weight or quantity of crop produced, and then a decision can be arrived at applicable to a large acreage.

BORER-RESISTING WOODS, RANAI, JARRAH, &c.

The Harbour Engineer, Mr. Bostock, has been expressing his opinion on the value of timber for the Harbour Works, and makes special reference to the durability of Australian Jarrah (Eucalyptus marginata) and the Ceylon wood known as Ramie. We give below some further information on this subject:—

Ranai or Yavaranai (Tamil) is the Singhalese Wewarani; Alseodaphne (Persea) semecarpifolia, a tree belonging to the order Lauraceæ (the cinnamon family). Dr. Trimen thus refers to it in his Flora:—"Forests of the dry region, common. One of our best timber trees. The wood is exported from Trincomalee; it is heavy, durable, straight-grained, pale greyish-orange, and can be obtained of large size." W. Ferguson in his "Ceylon Timber Trees" makes mention of the tree referring to it as Ranee or grain wood and draws attention to the reports on the timbers of the Wanni and Batticaloa in yealy Dutch Compendium for 1789;—"This though long known as a valuable timber tree in various parts of the island, has only lately become of importance as a timber sent from Trincomalee to the Commissariat at Colombo. It is a common and gigantic forest tree near Batticaloa and Trincomalee, and is likely to become of considerable importance as a Ceylon timber tree of value for building and other economical purposes. It is of a light yellow color and said not to be liable to warp. Some specimens of it that I worked upon had the grain much confused; but in general it has a free straight grain and is easily worked. Logs of large dimensions of it can be procured from Trincomalee, it has been exported for some years past under its native name of Yaverne. Mr. C. A. Krickenbeek, who was stationed for some years at Batticaloa, informs me that the wood of the Rane resist the attacks of the teredo and wood-boring insects, and that it is consequently much used in that district in the construction of boats, &c. I beg to offer my best thanks to Messrs. Morris and Saunders, Government Agent and Assistant, and to Captain Watson, of the Commisariat Department at Trincomalee, and to Messrs. Grinlinton and Birch of Batticaloa, for the very obliging manner in which they supplied me with specimens both in flower and fruit of this tree, besides useful facts, and which enabled me to thus identify the plant botanically. I am fortunate in having Mendis Mudaliyar's original dried specimen of this plant No. 95. 'Wea Waene' from the Central Province and called "Cratæva Roxburghii" and though not in flower, I have no doubt of its being identical with the tree now described. Wood used for house building and pestles,—Mendis. Excellent wood and much used at Trincomalee as a substitute for deal—Wright." Mr. Alexander, late of the Forest Department, says in his Timber Trees of the Central Province that the tree affords most excellent useful wood, which weighs 52 lb. per cubic foot. Another late member of the Forest Department, writing of the timbers of the Northern Province, speaks of Ranai as 'a common and frequently a very large tree in this province, and has a reputation of being a very valuable timber on account (amongst other qualities) of its resisting the attacks of the teredo and wood-boring insects; however, this may be in other parts, it certainly is not true of it in this province as regards the attacks of wood-boring insects, as my own experience here is that the tree is very subject to such attacks. Only last month (October 1891) in felling telegraph posts, I found in 27 trees, 18 of them utterly useless on account of their being riddled with wood-borers. It is true that these trees were more or less suppressed trees, and perhaps, under more favourable circumstances they escape the attacks of insects. I have seen felled trees of 5 feet girth without defects. It is a good timber and extensively used for various purposes.'

In the "Ceylon Forester" for February 1895 occurs the following note about Ranai:—"It attains a height of 50 feet and seldom branches under 18 or 20 feet. Logs of 30 feet in length are not uncommon. It does not attain a very great girth, seldom if ever exceeding 8 feet in circumference. . . . The wood is a light brown, is much used in house building, and also for bridge planks. It realizes 90 cents to R1·12 per cubic foot. There is a large supply available for future use. Unfortunately it is very liable to be attacked when growing, by a beetle, tho kmuminiya, of the Sinhalese, which bores holes in it, and trees apparently sound are often found full of these holes."

In the Kew Bulletin (Nos. 82-83 of 1893) is published some correspondence with reference to the use of Jarrah timber for paving carriage ways and public streets. Among other letters is one from the Borough Engineer and Surveyor, St. Pancras, to the Royal Gardens, Kew, in which the writer refers to the experiments made by the Engineer-in-Chief of the Natal Harbour, which showed that the "Jarrah, Greenheart, and other timbers have all been more or less severely attacked by the worm, while the Madagascar timbers have been practically untouched." The Engineer of St. Pancras Borough, himself speaks to the destruction of Jarrah by borers, in his letter. Unfortunately the names of the Madagascar timbers referred to are not given.

It will be seen, therefore, that there is a want of unanimity among the authorities as regards both Ranai and Jarrah, the merits of which are being at present discussed.

What of Palu (Mimusops hexandra) of which Mr. Broun, the Conservator of Forests, says:—"Palu is very strong and exceedingly durable. I was informed that some piles put in at Mannar during the time of the Dutch, were taken out some six years ago, and were almost as good as when they were put in. The hardness of the wood, and possibly some essential oil which it contains, protect it from the attacks of the teredo."

I am sending specimens of Ranai and Palu wood."

[But, is not the latter timber (Palu) getting very scarce?—Ed. *T.A.*]

JAMAICA SORREL ("HIBISCUS SABDARIFFA.")

[This grows well in Ceylon.—Ed. *T.A.*]

(*From the Florida Agriculturist.*)

The fact that my sorrel is blooming freely reminds me of a promise to say, through the columns of the *Agriculturist*, something of the methods of using it. In the first place then, the edible portion is the fleshy calyx that surrounds the seed ball. The pod itself is of no value and should not be cooked, but only the brilliant red husk that surrounds it. It is ready for use at any time after the flower has dropped a week until it begins to dry up as the seed ripens. After it is picked or cut from the bush take the pod, fruit or berry, or whatever you please to call it, between the thumb and finger of your left hand, stem end up, and with a knife cut off the stem and a little of the ball with it. This will enable you to easily remove

the expression of his desire to grant assistance, and for the interest he has shown in the matter from its inception,

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Kandy, Jan. 1898.

SIR,—I am directed to inform you that the well-known Cryptogamist (Mr. J. B. Carruthers, F.L.S.,) has been invited to Ceylon to investigate the cacao disease, and is now engaged in microscopic work on Wariapolla estate. This microscopic work is a necessary preliminary to gaining a full knowledge of the cause of the disease, and may occupy the cryptogamist some two or three months. When this work has been completed Mr. Carruthers will be in a position to make further investigation as to the means to be adopted for curing or preventing the disease.

Government have given a conditional promise, that they will defray half the cost.

The terms made with Mr. Carruthers are, that he should receive a first-class return passage costing say £100 sterling, and £200 sterling in cash for six months, and that should his services be required longer than six months, he is to receive £30 sterling per mensem for each month beyond the six months.

Should the investigation occcupy twelve months, the total amount required will be R7,200, and this amount, it is proposed to collect by means of a guarantee fund, the amount actually payable by the guarantors, to be in proportion to the amount of their guarantee. The following sums have already been guaranteed, but if the full amount be subscribed it is expected that not more than half of the guarantee will be called up.

All information will be made public, and Mr. Carruthers will be prepared to visit estates belonging to subscribers, when his microscopic work is completed.—I am, sir, yours faithfully, A. PHILIP,
Secretary to the Planters' Association of Ceylon.

AMOUNT REFERRED TO.	£.	stg.
Eastern Produce and Estates Co.	25	,,
Anglo Ceylon and Genl. Est. Co.	25	,,
Wariapolla Estate	25	,,
Suduganga ,,	15	,,
	—	
	90.	

61-62, Gracechurch Street, London, E.C., 26th Nov., 1897.

A. Philip, Esq., Secretary, Planters' Association, Kandy, Ceylon.

Dear Sir,—I enclose for the information of your Committee, copy of correspondence in reference to the proposed appointment of a cryptogamist to investigate the cause of the disease under which the cacao trees have been suffering in Ceylon.

I may add that the Government having failed to do anything in the matter, Mr. L. B. H. Dickenson, who has been taken great interest therein, has accepted the responsibility of himself employing Mr. J. B. Carruthers, a gentleman most strongly recommended by Mr. G. Murray, the Keeper of Botany, at the British Museum (natural history).

Messrs. Dickenson and Carruthers leave London this evening to meet ss. "Himalaya" for Colombo, at Brindisi.—Yours faithfully,
(Signed) WM. MARTIN LEAKE, Secretary.

Ceylon Association in London, 61-62, Gracechurch Street, 19th October, 1897.

The Right Hon. the Secretary of State, for the Colonies.

Sir,—The Cacao Planters of Ceylon are, as you are aware, anxious that the services of a qualified cryptogamist should be engaged to investigate on the spot the disease, from which the cacao trees are suffering, now ascertained to be fungus.

The matter is stated by them to be pressing, as the next two months are the season when the fungus is most active.

I am to suggest that if no instructions have yet been received from Ceylon for the engagement of a cryptogamist, a telegram should be sent asking for them, as no time should be lost.

I am to add that two qualified gentlemen, have expressed their willingness to undertake the mission —Mr. John Parker, of Trin. College, Cambridge; and Mr. J. B. Carruthers, son of the late head of the Botanical Department of the Natural History Museum.

Prof. Marshall Ward can speak for the former, Mr. Murray of the Natural History Museum for the latter.—I am, Sir, your obedient servant,
(Signed) WM. MARTIN LEAKE, Secretary.

Downing Street, 23rd October, 1897.

Sir,—I am directed by Mr. Secretary Chamberlain, to acknowledge the receipt of your letter of the 19th instant, urging that a specialist should be engaged to enquire into the nature of the disease which has attacked the cacao trees in Ceylon.

In reply enclose for your information copy of a letter on this subject from the Director of Kew Gardens, and I am to inform you that in view of Mr. Dyer's recommendations Mr. Chamberlain informed the Governor, last August that he did not propose to send out a specialist to the Colony.—I am, your obedient servant, (Signed) C. P. LUCAS,

The Secretary to the Ceylon Association.

Copy of Letter Referred to.

Royal Gardens, Kew, July, 31st 1897.

Sir,—Referring to your letter on April 21st last (8,212/97) on the subject of a disease which has attacked the cacao plant in Ceylon, and my reply of April 22nd, following, I have now the honor to say that I have received from the Director of the Royal Botanic Gardens, Peradeniya, specimens from diseased trees which have been subjected to careful examination.

2. I enclose a report upon these specimens, which I think leaves little room for doubt that the disease is due to a fungus, the groweth of which has been promoted by unsuitable methods of cultivation. I further enclose, a memorandum by the Assistant Director as to the remedial measures which the circumstances suggest.

3. With this information before him, the Director of the Royal Botanic Gardens, Peradeniya, ought to be able to deal with the problem. I am not therefore prepared to recommend that a specialist should be sent to Ceylon as suggested by the Governor.—I am etc., (Signed) W. TISELTON DYRE.

Fred. Graham, Esq., Colonial Office, Downing Street,

Wariapola, Matale, December, 14th, 1897.

The Secretary of the Planters' Association of Ceylon, Kandy.

Dear Sir,—Referring to your conversation today on the subject for the Cryptogamist of the cacao, I write to ask whether you would consider it a good plan for circulars to be sent from the Planters' Association to the owners of cacao estates in Ceylon, asking them to contribute towards the balance of the cost of getting out the Cryptogamist, which is not paid by the Ceylon Government, which however is not certain yet although it seems probable. I proposed to ask the Ceylon Government to contribute one half of the cost and the Hon. Mr. J. N. Campbell, whom I saw today has promised to use his influence with Government to secure the same object we have in view. It has occurred to me to suggest for your consideration that a circular from your Association to the different owners of cacao, asking for contributions would come better than an application from a private individual like myself, and if you are of the same opinion and see your away to carry it out, I should be very much obliged.—I am, dear Sir, yours faithfully, (Signed) L. B. H. DICKENSON,

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Kandy, 15th December, 189

L. B. H. Dickenson, Esq., Warriapola, Matale.

Dear Sir,—I am in receipt of your letter of the 14th instant, and in reply write to say that until he matter is laid before the Committee of the

Planters' Association at its next meeting in January, I do not think that I could officially move. Meantime I am disposed to suggest that you might keep me informed, by perhaps sending me a copy of your letter to Government, and any reply received thereto, for the information and guidance of the Committee in deciding whether the Planters' Association can, and if so in what way, best assist in the furtherance of your views.—I am, Dear Sir, Yours faithfully,

(Signed) A. PHILIP, Secretary.

Wariapolla, Matale, Dec. 16th, 1897.

The Secy., Planters' Association of Ceylon, Kandy.

DEAR SIR,—Referring to your letter of the 15th instant, I enclose copy of my letter to Government asking Government to pay half the cost of Mr. Carruthers' investigation of the cacao disease. I will also keep you fully informed of all that goes on, sending you a copy of any and all letters in connection with this subject.—I am, dear sir, yours faithfully,

(Signed) L. B. H. DICKENSON.

P.S.—I had an interview with the Hon. Mr. J. N. Campbell, in Kandy on the 14th instant, and he promised to press the matter upon the attention of Government.

Wariapola, Matale, Dec. 16th, 1897.

The Hon. the COLONIAL SECRETARY, Colombo.

SIR,—Referring to my previous correspondence on the subject of securing the services of a cryptogamist from England for the purpose of investigating the disease affecting the cacao in Ceylon, and to the Hon Mr. North Christie's communication with His Excellency the Governor on the subject, in March last I have the honour to inform you that as it appeared to be a matter of the first importance that the cryptogamist should commence his investigations before the heavy rains of October, November and December are over, when the disease of the cacao is most virulent the proprietors of Wariapola and Suduganga met in London and decided to arrange with Mr. J. B. Carruthers, F.L.S., to proceed to Ceylon by ss. "Himalaya" which arrived in Colombo, on the 11th instant. It may be mentioned that Mr. Carruthers has the highest recommendation from Mr. George Murray, F.R.S. etc. Keeper of Botany, British Museum (Natural History) as a Cryptogamist, who is competent to investigate such a disease as we have in cacao and that Mr. Carruthers has also been lately employed by the Royal Agricultural Society of England, to investigate the disease in Larch and also the disease affecting Elm trees.

The terms on which Mr. Carruthers, agreed to visit Ceylon, are that he should receive a first-class return passage and £200 in cash for six months and that should his services be required longer than six months, he is to receive £30 per mensem for each month beyond the six months. For the reasons previously mentioned the proprietors of Wariapola and Suduganga, viz Messrs. Fraser, Hutton and myself, have guaranteed the payment of the sums mentioned hoping that after Mr. Carruthers had arrived in the Island, His Excellency the Governor, might perhaps appoint Mr. Carruthers as Cryptogamist in pay of the Government or failing that, that perhaps His Excellency the Governor might be willing to pay half the cost and that the other half might be contributed by the owners of cacao estates. As since my arrival in the Island I have learned that the Secretary of State has voted the appointment of a Cryptogamist by the Ceylon Government, I write to ask whether His Excellency the Governor would be willing for the Ceylon Government to contribute half the cost, (say one hundred and fifty pounds for the first six months, and £15 for any extension necessary) of Mr. Carruthers' visit to Ceylon, the other half to be contributed by the owners of cacao estates. I don't think that I need urge the importance of the cacao industry to Ceylon, both to natives and Europeans alike, both as an adjunct to tea and as an easy cultivation and natives in the lower districts of the island nor the seriousness of the disease. All are well known to his Excellency. When not affected by the disease, cacao thrives as vigorously as ever and with market prospects so much improved and with every prospect of better prices, it seems a thousand pities for so valuable an industry to be ruined by a disease, which for various reasons unnecessary to mention, appears to be capable of successful treatment at the hands of a Scientist, who seems so capable for his work.

I am, sir, yours obedient servant,

(Signed) L. B. H. DICKENSON.

Colonial Secretary's Office,

Colombo, 18th January, 1898.

SIR,—I am directed by the Governor to enclose herein for the information of the Planters' Association, a copy of a despatch received from the Secretary of State and to state that should Mr. Carruthers' enquiry prove to be useful and beneficial, His Excellency will be prepared to propose to the Secretary of State, that Government should pay half the expenses connected with his deputation.

I am, sir, your obedient servant,

(Signed) H. WHITE, for Colonial Secretary.

The Secretary to the Planters' Association of Ceylon.

Copy of Despatch Referred to Ceylon, No. 370.

Downing Street, 26th November, 1897.

Sir,—I have the honor to inform you that since I wrote my despatch No. 352 of the 10th instant, I have been given to understand that persons interested in cacao planting, are sending out to Ceylon, by today's mail, Mr. J. B. Carruthers to investigate the cacao disease.

It was fully explained to Mr. Carruthers, when he called at this Office, that his employment being purely unofficial will not give him any claim to the Government appointment of Scientific Assistant in the Botanical Department should that post be created, although of course if he desires to apply for the appointment, his name would be considered with those of other candidates.—I have &c.,

(Signed) J. CHAMBERLAIN.

Governor, the Right Honourable Sir J. West Ridgeway, K. C. B., K. C. S. I., &c., &c., &c.

Other subscriptions received since were:—

	£.
Finlay, Muir & Co.	25
Sir T. J. Lipton	15
Major Pain	10
E. G. Simpson	10
C. M. Henry	10
F. Tatham, on account of Tea Corporation, Ltd.	5
Ratwatte Cocoa Co.	7
Pallakelle Co.	15
J. R. Martin for three estates, Yatewatte, Hilton and another	30
	R.
Mr. Beechcroft	100
———	100

The CHAIRMAN remarked that, in moving the adoption of the Report, he had only briefly to say that Mr. Carruthers came out under an arrangement with Mr. Dickenson of Wariapola, and if they succeeded in obtaining the guarantee which they were endeavouring to obtain, any arrangement by Mr. Carruthers with Mr. Dickenson would pass to the Planters' Association. He then moved the adoption of the Report adding that that meant that circulars would be sent to all cacao planters and superintendents they could discover.

The report was adopted.

This concluded the business of the meeting and a vote of thanks to the Chairman proposed by Mr. W. D. Gibbon terminated the proceedings

isfactoy to them on this occasion if payment was limited to out of pocket expense incurred in connection with the business to the Company.

PLANTERS AND THE SOUTH OF INDIA RICE TRADE.

INDIAN AND CEYLON RAILWAYS COMPARED !

The party consisted of Mr. James Ryan, Mr. A. M. Fortes, Mr. G. C. Bliss, Mr. A. M. Carmichael, and Mr. P. F. Ryan of Ceylon Planters' who went to Southern India to see what prospects there were of inducing rice-growers and dealers there to take advantage of the new rates of through traffic to Ceylon devised by the Southern India Railway, and also what the feeling was on the proposal that the said dealers should send rice direct to Ceylon estates, instead of forwarding the same to Colombo Chetties, have returned to Colombo and Mr. Ryan, speaking to the representative of the local "Times," said :—Their position was that the Southern Indian Railway had reduced their rates for carrying rice enormously, speaking of the journey he said :—"The charges are exceedingly moderate—you get tiffin or breakfast for a rupee ; dinner for R1·50, and drinks are in proportion—all very much cheaper than you get in the Railway Refreshment Car in Ceylon. The same beer you get here—(Beck's)—at 75 cents a bottle you can buy up there—300 miles in the interior of India—for 56 cents ; you can also get baths in the railway stations practically for nothing. You can stay at a station for a day, and you are only charged the small sum of 50 cents or a rupee for occupation of the station, use of bath and everything. Then, on the train, they gave us a special carriage all to ourselves, and in this carriage there was a servants' compartment, where our boys could cook anything for us that we liked, and also we were given the privilege of breaking our journey anywhere we pleased. We had only to give the word, and we could be run into siding and disconnected at any station—and in fact it was railway travelling under the most pleasant conditions—practically we could stop where we liked, and then when we went on we had only to, as it were, step out and whistle for the engine.

They visited Trinchinopoly and at Negapatam their real business began. They arrived on Sunday morning, and had an interview with the Chetties and leading rice merchants gathered in conclave. Captain Shelly was not with them then, but Mr. Mercer, of the South Indian Railway, accompanied them. Mr. Ryan's party showed the rice-dealers the samples of the rice Ceylon requires, and the Chetttes showed them samples of what they could supply, and, in spite of the name that Negapatam has as the head-quarters of the sea-borne trade, the dealers pointed out that, owing to difficulties of navigation in the North-East monsoon, the through-booking system to Tuticorin would pay them to use, in fact it was particularly attractive for them as far as the North-East monsoon was concerned, though in the South-West monsoon they thought the native boats would do the work cheaper. They also expressed their willingness to deal directly with Ceylon planters on certain lines which the visitors laid down, so as to do away with any connection with Colombo dealers.

AT TANJORE AND CUDDALORE.

That night the party dined at Tanjore, where they did all the sights, and they also had a very large meeting with the rice merchants and growers in that district. "Our interview was very long and full," said Mr. Ryan, "and embraced every possible point, and the rice-growers expressed themselves as quite ready—in fact, anxious, to deal, and at rates which would certainly be remunerative." Next they went to Cuddalore, which is the farthest station on the line to which the through-rates have been extended. There they saw only one merchant, whose ideas of business were exceedingly vague. After they left, some 500 bushels of rice were offered them for sale from this place—the offer being wired to them, but they were at rates quite impossible to touch. The only satisfaction the party got at Cuddalore was from an oyster feast. Cuddalore is a sort of Indian Colchester in this respect ; there are splendid oysters and they are very cheap. They paid 15 annas for 250, and then heard later from experts that they were swindled, as the ordinary rate is only annas 4 per 100.

SATISFACTORY INTERVIEWS.

Next they journeyed to Shiyali, where they saw rice dealers, and a large grower—a man owning some 3,500 acres of land, who spoke English fluently and does business already with Colombo direct. He was able to give them a very valuable series of figures, showing his prices for rice for the last five years, and on the whole this was the most satisfactory interview they had. After Shiyali they travelled to Dindignl, where they saw some more cheroot manufacture going on, and they returned *via* Madura to Tuticorin, which they reached yesterday morning. There they interviewed and discussed the matter of finance with the banker, and they also interviewed a gentleman who is

PREPARED TO TAKE UP THE EUROPEAN AGENCY

at Tuticorin. Then they rejoined the "Katoria," and they had a very rough passage in the steam launch out to her anchorage. This launch belongs to Messrs. Adamson and McTaggart, and the party unanimously vote it a disgrace. Said their spokesman : "Seas come over it ; it is very insufficiently protected from the weather, and the coolies who came out by it all got wringing wet."

THE TREATMENT OF C OLIES AT TUTICORIN.

"There is a great deal left to be desired in the treatment the coolies experience at Tuticorin jetty," said Mr. Ryan further. "We saw a gang of some 15 coolies turned back from the pierhead on the jetty who were said to be too late, but who, to our knowledge, had been there the best part of an hour—and they were sent back three-quarters of an hour before the launch started, and though there was ample room for them on it. Thereby they were exposed to all the evils of another day's extortions from the blackmailers at Tuticorin and the seductions of the crimps. We also heard that crimping and extortions are not confined to men of the town of Tuticorin, for the launch men have been known to have levied black mail from them. There is also a charge for luggage on the launch—50cts. a package which is excessive for the work done, because a ton of ordinary goods are taken in a lighter for the same price." Then the party had a very rough passage back to Ceylon.

CONCLUSIONS.

"In the main," Mr. Ryan concluded, "we are of opinion that when rice reaches a normal price in Southern India (which it is not at present owing to the abnormal season) there is no doubt that business can be done on the through-looking

system, with profit to the grower and the buyer in Ceylon. In spite of the scarcity, 25,000, bags of rice have already been booked over the rail during the past two months under the new rate, by cultivators and dealers,—this information we got from the Railway authorities. We went over, I may say, at a bad time ; we ought to have waited awhile till the March crop is coming in. Then there may be a larger lot sent in this way. Even now, more might have been done had it not been that the dealers now had only small bags mostly in stock, which did not allow of their getting the full advantage of the concession. The ordinary bag in use at present appears to be one of 25 markals, whereas the rate calculated by the S. I. Railway is for a bag of 27 markals. Rice, I may add, is carried on the S. I. Railway at a rate that works out at about

ONE TENTH OF THE CEYLON RAILWAY RATE.

"Coolies also travel on the line cheaper than they do here—they pay only a cent a mile—in fact, the Ceylon Government Railway has many tips to learn from the South Indian Railway. All their shunting is done far quicker and far quieter than it is here, and their general management is better—yet there are no European guards, no European Station Masters, no Europeans on the line at all ; but every man seems to put his shoulder to the wheel to get a train out of a station quickly, and, though we travelled over some thousand miles of the railway, and stopped I don't know how many times, on no occasion was the train five minutes late on schedule time in getting to a station—in fact I might say two minutes. And this is a single line and metre-gauge ! We had nine days' incessant travelling on the line, and never knew a train two minutes late."

The report of the party will be laid before the C. P. Association at its meeting in February.

RUSSIA AND CEYLON TEA.

Mr. J. Findlay, who arrived here a few days ago from China, has come with the object of arranging for the establishment of an agency here for exporting Ceylon tea to Russia. He is a representative of Messrs. Molbhanoff Peachatnof and Company, the largest firm of tea-buyers for Russia in the North of China, and proposes to open the branch here on the 1st of March, the tea-rooms and offices being on the same premises as Messrs. Bois Brothers in Queen Street. The agency will—the "Independent" says—be managed by a Russian gentleman at present in China, while a tea-taster will be got out from the firm of Messrs. Travers & Son in London.

THE TASTE IN RUSSIA.

Ceylon tea is increasing in popularity in Russia, and is gaining more favour with the Russians. But this, of course, is due not so much to any particular liking the Russians have for Ceylon tea, as on account of its strength and usefulness for mixing with China tea. The taste in Russia has of late considerably changed, and whereas formerly they preferred light-flavoured teas, they now want teas with more strength.

THE USE OF MACHINERY IN CHINA.

A new company is in process of formation in Kankow under the auspices of the Imperial Maritimes Customs, to make teas with a certain quantity of machinery in the Ceylon style. In the attempt proves successful, as we have no doubt it will, it will lead to the introduction of machinery generally in China.

Mr. Findlay does not appear to be a believer in the Sirocco. He thinks the Chinese system of firing is infinitely preferable.

CEYLON AND CHINA TEAS.

The unpopularity of China tea in some quarters is chiefly owing to the fact that the tea is manufactured by hand, whereas if machinery were used a greater degree of cleanliness could be attained. In this particular Ceylon tea has a grand advantage. But although so much has been said about the uncleanliness of China tea there are some people who are inclined to the belief that the ideal of such uncleanliness is purely a myth. If that is really so, the question will be merely one of taste. Mr. Findlay is under the impression that the secret of the strength of Ceylon tea as compared with China lies in the withering and fermentation. He is a strong belief in that if the Chinese do ever adopt Ceylon methods, they can make teas that will have all the strength of Ceylon teas, and yet retain all the softness peculiar to their own teas. But *when* the Chinese will do that is quite another thing !

RUSSIAN HOUSES IN CEYLON.

It is probable that two more Russian houses will be established in Ceylon in the course of the present year. Mr. Findlay has a peculiar liking for China tea, but it is not a matter for surprise. He has been associated with the tea industry in China for the past 26 years, and his taste for tea must naturally have been trained towards China.

PLUMBAGO IN MADAWALATENNA.

We learn that Captain Leonard Tregay has opened up some very fine shows of plumbago on Monerakande estate, which the proprietor (Mr. Tottenham) hopes to turn to account in due course. The deposit appears to be extensive, and of the best quality for the most part.

CACAO DISEASE INVESTIGATIONS.

(*From Proceedings of the Ceylon Planters' Association, held 31st January, 1898.*)

The next business was to receive an interim report of the Sub-Committee on cacao disease investigation, and the report which was read by the Secretary was as follows : "The Sub-Committee having considered the annexed correspondence in reference to the appointment of Mr. J. B. Carruthers, F.L.S., as Cryptogamist to investigate the cause of the disease under which the cacao trees are suffering in Ceylon herein report progress, and recommend that all cacao proprietors—whether Companys or individuls—be invited to contribute to a guarantee fund for the purpose of defraying the exenses of the Cryptogamist. The total sum required to be guaranteed may be placed at R7,200, and it is hoped that the sum will be at once subscribed. Your thanks are due to Mr. Wm. Martin Leake, Secretary, Ceylon Association in London for assistance, on the suggestion and representation of Mr. L. H. B. Dickenson for the assistance in the initial steps, and who ultimately succeeded in finding a gentleman of Mr. Carruthers' qualification. Your thanks are also due to the proprietors of Wariapola and Suduganga, for their enterprise and public spirit in at once securing Mr. Carruthers' services. The circular letter appended to this report addressed to all cacao growers explains in some detail the manner in which it is proposed to make Mr. Carruthers' services, and the results of his investigation available so as to be generally useful. Your acknowledgments are further due to His Excellency the Governor for

THE CEYLON FISHING CLUB.

We direct attention to the annual Report of this institution below, which contains details and informations of special interest to anglers and to all concerned about the successful acclimatisation and propagation of trout in Ceylon. The Committee and Secretaries have had a very trying experience last year: but there is much encouragement to persevere and the fact that trout have been caught up to 1, 2, 2½ and of 3¾ lb. weight shew results already attained one of great value. As to spawning, it is rightly mentioned that it took ten years before success was attained in this respect in New Zealand rivers. What is wanted now is that some angler of experience and leisure with a proper love of natural history should settle down in Nuwara Eliya and study the life history of the trout in our highland streams.

ANNUAL REPORT.

The following is a copy of the official annual report of this Club :—

The last annual meeting of this Club was held on September 12th 1896, when a report was read by the then Hon. Secretary, Mr. Lushington. Subsequently three meetings were held; one on December 23rd, 1896, when the usual election of office-bearers for the ensuing year took place, and the accounts of the Club up to that date were laid on the table. A second meeting was held on March 1st, 1897, to discuss the distribution of the fry; and a third meeting was held on September 25th, at the request of several members, when a preliminary report was submitted by the Hon. Secretaries, the accounts up to date were laid on the table and passed, and the arrangements as to ova for the next hatching season were discussed.

During the year the following rules were altered or amended :—

In Rnle 1 page 2 the word was "person" deleted and the words "resident in the island" were substituted for it.

The following words were added to Rule 11: —"Snfficient notice of such proposed alteration or amendment shall be given to the Honorary Secretaries to allow them to give each member of the Ceylon Fishing Club ten days' notice before the General Meeting of such alteration or amendment."

Rule 3. That licenses to fish for trout by nonmembers of the Clnb shall be at the following rates:—

One day	(*a*)	R 12·50
One week	(*b*)	,, 25·00
One month	(*c*)	,, 75·00
The whole season	(*d*)	,, 120·00

Rule 5 Sec. (*b*) was altered to read thus:—They shall at once return to the water all trout accidentally caught.

Rule 7. The words "subject however to the exception contained in Rule No. 5" were expunged.

It will in consequence be advisable to brin out a fresh edition of the C. F. C. rules.

It was also decided to keep on the present keeper, who has done good work during the year in watching the local streams and lakes, preventing poaching and prosecuting offenders, and to employ in a similar capacity the Resthouse-keeper Horton Plains, and the Pattipola Resthouse-keeper.

The fish-register kept at the Horton Plains Resthonse having proved successful and interesting, it was thought advisable to start similar books in Nuwara Eliya; and the Grand Hotel, the Club, St. Andrews and Keena Cottage have each been supplied with one. It is hoped that fishermen will help the Club by entering them up carefully.

The Horton Plains register shows that 384 fish were caught by members between February 15th and August 22nd, of which 216 were under 11 inches and were returned to the water. The largest fish taken was one of 3¾ lb caught by Mr. A. T. Cathcart, while eight fish were caught between 2 and 2½ lb.; 70 between 1 and 2 lb; and 89 between ¾ and 1 lb. Unfortunately there is no register of fish caught in Nuwara Eliya, thongh it is hoped that this will be remedied by next year.

The alteration of the dates of the close season has been discussed, bnt no definite conclusion has yet been arrived at. It is a difficult qnestion, on which everybody differs. The fact is we none of us know much about the breeding habits of trout in these waters, and the alteration in their habits caused by change of climate, food, etc., because we are most of us busy men who have no time to devote to the close daily observation necessary for such a study. A leisured man, with previous experience, who would take up the matter as a hobby, would be a real godsend.

Two stew-ponds were made early in the year, one by the kind permission of H.E. the Governor, in the grounds of Queen's Cottage, and one under the superintendence of Mr. Farr, at the Horton Plains. It is too early yet to pronounce whether they are a snccess or a failure. Fry were supplied to each, but the Horton Plains pond was seriously affected by a heavy flood. The Queen's Cottage pond has been undisturbed, and it will be dragged early next year, before fresh fry are put in, to ascertain how the last year's fry have fared.

A great many female trout full of spawn were sent to us for inspection by the fishermen who caught them in July and August, but hardly any males were caught then with signs of milt in them. Every effort was made to discover signs of fish working up towards the headwaters in pairs, or of females depositing eggs in the sand, and the removal of sand and rubble from the upper parts of the streams was prohibited for several weeks, in order to keep the waters as undisturbed as possible; but it cannot be said that so far there are any certain proofs that the trout are spawning in the Nuwara Eliya streams. An experienced member; the former Hon. Secretary of the Club, is of opinion that they never will, and that our one hope of spawning lies in the Horton Plains streams. On the other hand our streams here are not much warmer than, or very different from, some of the streams in New Zealand, where it took from 10 to 12 years before the fish would spawn; and the power of adaptation to environment, latent in all animals, tront included, is well worth waiting for and endeavouring to encourage.

THE OUTTURN OF FRY.

Under this head, the year's record has been disappointing to the verge of disaster. Forty thousand ova were ordered out at the end of 1896 from the usual source—the Surrey Trout Farm of the Messrs. Andrews. They arrived in two batches, in January and February. Every possible precaution was taken to ensnre their immediate delivery and rapid transport to Nnwara Eliya. The hatchery and trout honse were in excellent order, the latter having been doubled in size. Unfortunately Messrs. Andrews experienced great difficulty in finding properly appointed ships to carry the ova, and, in order not to miss the dates, they shipped them by vessels where there were no proper cold rooms and no snfficient store of ice. Nor were the boxes left undisturbed, but had obviously been turned up on end and shifted about ruthlessly. The resnlt was that the first batch was ruined and the second very nearly so. The eggs, when nnpacked, instead of lying flat, were found crushed together into a horrid mass of corruption, and it took many hours' hard work, day and night, to extract the possible survivors. These, however, were so hopelessly affected by the corruption of their neighbours, that fungus set in almost at once, and spread with fatal rapidity, so that eventually only 1,596 fry were hatched, and were distributed as follows:—

200 to Ambewa Oya.
100 to Queen's Cottage Stew-pond,
396 to Nuwara Eliya Streams.
400 to Bulnhala Oya and Kurnndu Oya.
500 to Horton Plains Streams and Stew-pond.

It is a disappointing result, but it is as useless to cry over spilt milk as over spoilt ova. Messrs. Andrews reduced their bill by about 1/3rd, and

have promised to be more carefnl in fntnre as to shipping the eggs; and it is hoped that arrangements have been made as regards the coming batches, which will prevent the recurrence of such disasters. It may be some slight comfort to know that we are not the only Club that has to face such disappointments, for the annnal report of the Nilgherry Game and Fish Association has a very similar tale to tell, and even heavier losses to deplore. If it were necessary further to prove that "tbe best-laid schemes of trout and men gang oft agley," two slight incidents might be mentioned which confirm the theory. As it was an abnormally warm season when the ova arrived, we telegraphed to Colombo for ice, to lower the temperature in the filter boxes. It arrived packed in kerosine tins! and so impregnated with oil that none of it conld be used. Again, about forty of our few surviving fry suddenly died in 24 hours, of no perceptible cause except a small red spot on the gullet. A careful search through the troughs disclosed the presence of three or four leeches, and if these were really the cause of the loss, another terror is added to the troubles of tropical trout breeding.

FINANCE.

The financial condition of the Club is qnite satisfactory. After paying for the nnlucky ova, and meeting two abnormal and heavy charges, the rebuilding of the hatchery and the making of the Stew-pond at Queen's Cottage, the balance to our credit today is R1,230·91. Our income has steadily increased both in the way of subscriptions and licenses, in spite of the manifold claims upon the purse during Jubilee Year; and, as far as one can judge, the average fisherman finds quite enough sport to justify his expenditure.—S. M. BURROWS, J. WICKWAR, Hon. Secretaries.

The accounts from October 1st, 1896, to November 30th, 1897, showed the receipts (including a balance of R1,213·58 from last year's account) to be R4,459·31 and that after meeting payments there was a balance of R1,258·66.

COFFEE PLANTING IN COSTA RICA.

Report of proceedings at the First Annual General Meeting of the Sarapiqui estates Company, Limted, held at the Terminus Hotel, Cannon Street, E. C. On Tuesday, December 21, 1897. Mr. Gilbert D. Jennings in the Chair.

After the notice convening the meeting had been read by the Secretary, the CHAIRMAN said: In calling the attention of the Shareholders to a few more details than are given in the Report, I will begin with the Accounts that we have before us. I am happy to say that all the calls up to the present date on our Shares are enoashed. I wish also to explain the amount of £3,000 due to the Vendor for purchase money retained in hand. That sum is retained in hand to cover certain liabilities of the Vendor for advances made to him, and for taxes on the Estate. It probably will be cleared at an early date. Tbe amount of the Bills Payable seems large, £2,850, but they havo all been since paid, and I think I may state that the company is without any liability whatever, beyond those of a trivial kind. On the credit side, the item development Account demands a word or two of explanation. The Development Account may be described as money laid out on the working plant of the Estates, such as machinery, water power (I am thankful to say that there is no prospect of our needing any power but the water power which lies close to our own doors), pasture ground, and certain other matters connected with the Estate, including road-making. Labour Advances and other Balances in Costa Rica amount to £2,985 2s 11d. These are advances made to labourers. It is the custom in Costa Rica to secnre labour by means of advances, which are worked off in one form or another, but principally in labour given to the Estate. The system is an advantageous one, and this account will reappear in the Balance Sheets year by year presented. The next item, I am glad to say, is the most satisfactory that we have on our Accounts:—Produce in Hand (since realised), £186 3s 6d. The Accounts deal with only 8 months, but already we have prodnce which we can point to as realisiug the expectations held out to the Shareholders in the prospectus. We have saved and secured under disadvantageons circumstances a certain quantity of the crop of last year, we have brought that qnantity to market, and and have realised for it a high price. The highest price for tbe best coffee is 108s, the average is 96s. and we, the Directors, may well congratnlate the Shareholders on having in their first accounts snch an item as "Sales of Produce."

We pass to Old Cultivatiou expenses. In order to keep tbe estate going, and to secnre the small amount of produce that was brought to market last year, we had to lay out the sum of £330 0s 5d. From this is deducted the amount realised for produce here, £186 3s 6d. There is a small ba'ance of produce now in Costa Rica to be realised, and the amount which we stand to lose (if we can call it losing) will be probably £50 or thereabouts; so that we shall have recovered witbin a very small amount all that we bave laid out ou our property before we come to actual profitable working. I venture to submit this is a very satisfactory state of things in the inception of a Company like ours.

With regard to New Cultivation Expenses, the sum under this heading will be charged against onr next crop, incoming within a few months, and now being gathered. The Admiuistration Expenses have been kept as low as it is possible to keep them. I would only remark on two points: one is tbat the salary of the Manager has not been fully drawn, in fact a very small amount up to tbe present date has been paid on account of it. The Directors have drawn absolutely nothing up to the present time. They do not intend to work for nothing and it is their intention to draw £250 on account of the £500 which stands, as yon will observe, on both sides of the Account, leaving the remainder over. It is necessary to put this amount of £500 in the account, but I wish to call your attention to the way in which the Directors propose to deal witb it.

There is only one otber item in the Account, viz., Preliminary Expenses. Tbese are the expenses which have to be debited to account of the formation of the Company, consisting principally of Brokerage on the Shares. Our company was not advertised, and no promoter had to be paid. I think you will agree with me tbat this oharge is reasonable.

Passing to the Report, we are glad to find that the acreage already being coffee, 128 acres in the prospectus, has remeasnrable to 144 acres—a small gain. Since the company has been formed some 400 acres have been taken in hand and partly planted with coffee. It was the intention of the Board at first to realise the company's Estate in many other directions beside coffee, but this intention has been modified by their subsequent consideration of the circumstances. It has been found that our capital is only enough to provide at present for cultivation. The profits from coffee lie close to our hands. The other profits, enticing as they may be, from the cultivation of rubber and tohacco or the realisation of Timber, are more remote, and as business men we consider that every fact before us leads in the direction of seeking our profit at present from coffee, and coffee alone; and we submit this to tbe shareholders believing that they will approve our plan. Tbe history of the company I need not refer to; it was formed from a small Syndicate which subscribed its money and has been repaid in Shares of the concern. Mr. Shand, to whom the Meeting will have the pleasure of listening directly, visited Costa Rica, and was so impressed with the value of the property that he expressed his willingness to join the Board. We received bim with great pleasure, and we have looked upon him as our main stay in planting matters. Mr. Rothe felt for Costa Rica in February, this year. When he arrived in Costa Rica he had all the legal business of the concern to do; the transfer of the titles, the translation of Documents, and the Registration of the Company. It is hard to see what work it was possible for him to do

on the Estate before May; however, he *did* work on the Estate before May, and you will agree with me that from the time of his first reaching Costa Rica up to the 31st of August, he has done a considerable amount in the development of our property. He has erected a water wheel in order to secure the water power. He has set up saw mills for the Timber, and for building the dwellings of the labourers; he has weeded the land; and he has felled a large quantity of new land, and begun to clear it. I think we must congratulate him on what he has already done. The future of the Company will receive the constant and vigilant attention of the Directors. To get the Accounts into a proper form so to be intelligible to English people has not been altogether an easy matter. They are kept with great accuracy according to the method of Costa Rica, but the method of Costa Rica and the method of England are not quite the same thing. So much has this pressed on the attention of the Directors that they have invited one of the body, Mr. R. P. Macfarlane, to visit the plantations, and he will start next month, with a view to getting the affairs of the Company focussed in such a way as that the Directors first, and the Shareholders after, shall be able to tell at a glance exactly how our plantations stand at any one moment. The Directors have felt sometimes a little regret at the delays that belong to planting enterprise in this new land. Costa Rica is a place of large profits, but it is a place of large delays and of enormous difficulties. Here in London, and in England generally, there have been people who have occupied our places before us, and we have entered into their labours. In Sarapiqui the reverse obtains; there has been nobody before us there, and we have had all the difficulties of pioneers; but these are being gradually, steadily and economically surmounted, and I have no hesitation whatever in commending to you this Report and Accounts, and asking that they may be received and adopted. The motion will be seconded by Mr. Shand.

Mr. J. L. SHAND: I have pleasure, Gentlemen, in seconding the adoption of the Report and Accounts. The Chairman has gone very fully into these matters, and I need not follow him into the details, but there are one or two things to which I should like to refer. In the first place neither myself nor my colleagues are altogether satisfied with the form which these Accounts take. We have been very much pressed for time to fulfil the conditions required to hold our General Meeting, and we have had difficulty in bringing the customs of Costa Rica into conformity with those customs which I myself and my colleagues, who have been on the Boards of other Companies with similar objects to this, consider absolutely necessary and indispensable. We shall as soon as possible get these things into the form which we consider desirable, and I can only say that the object of your Board, so long as it is constituted as it is at present, will be to put everything before you as plainly and straightly as possible. The Report is called an Annual General Report, but the actual transactions which are recorded extend only over the last quarter of the year under review, because the first two or three months we were busily engaged in the re-formation of the Company, which you will remember, and which I need not refer to further, but which resulted very much in favour of the Shareholders; in the second quarter we had considerable delay in the legal technicalities which had to be carried out in Costa Rica—translations, and various other works—in connection with the many things which had to be done before we got a title to the land; therefore, the actual working referred to in the Account is only over a period of three months, and I think we can say that in those three months we have made a very fair start. The labour has been organised, which is always a great difficulty when you go to a comparatively new part of a country; and I feel very certain when we have the pleasure of meeting you again we shall have a tale of much greater progress to tell. As I have had an opportunity of visiting the Estates it may not be out of place here for me to tell you that I endorse every word which appeared in my report, which you probably all had the opportunity of reading, and that is, that we possess a very magnificent property, in fact we have a very large area of land capable of producing Coffee of the very highest quality, and we have proved that it is of the highest quality by the sample sales which appear in the Accounts. We have land capable of producing Cocoa, Rubber, Tobacco, and in fact all other tropical products, and although we do not embark upon these at present, we do not lose sight of them, and I am in great hope that we shall soon be able to tell you that we see our way to the development of some of these things. In the meantime our resources are limited, and it is desirable that we should make use of those resources and the energies of our Manager to bring something to market as soon as possible. It is for this object that we have for the present confined ourselves to Coffee. The natural advantages which our land possesses are very great. We have a magnificent soil and a splendid climate—a climate which is not only suitable for tropical agriculture but which is a pleasant climate for labourers to dwell in—European or otherwise. We have an abundant rain-fall. We have well-watered lands with streams which we can utilize for our machinery all over it, and the natural advantages are very great; but at the same time there are other factors which might nullify these natural advantages altogether if we cannot secure them. One is a sufficient supply of labour, and another is means of transport by which we can get our requirements up to our Estates and get our produce to market easily. I think the labour difficulty, which I always looked upon as a thing we would have to face, is likely to adjust itself, and it will be for our Co-Director when he goes out, to see whether the supply of labour is sufficient, whether it would be desirable to import labour from some other part. With the advantages we have, with the good climate and the opportunity of giving constant work to labourers, I have no doubt we shall be able to secure all the labour we require. One other point is the means of transport. The President, who is a gentleman of the very highest intelligence, and who I am very glad to think has got a new term of office, I had a long interview with him on the subject. I ventured to point out that it was the duty of every civilized Government, if it wanted to take advantage of its waste land, to provide means of communication for pioneers who embarked money in those lands. He received me very kindly and talked very favourably on the subject, and he told me that a very considerable sum, 50,000 dollars, had been granted for the improvement of the road that leads to our property. When our Co-Director goes out, it will be his duty to impress upon the President that it will be impossible for us to carry out what we hope to do if we do not have assistance in getting means of communication either by road, river, or railway (and we have all these three strings to our bow) to enable us to bring our produce to market. My friend Mr. Macfarlane, who joined this Board at my special request, has had a very long and, I am happy to say, a prosperous experience of Coffee planting, and planting of other tropical products as well—exactly the experience which we want to commend in the management of our property out there. He has the hearty co-operation of all our Board, and we all attach the greatest value to his visit to Costa Rica. With these words I will second the adoption of the Report and Accounts. I am sure that in answer to any questions you have to ask we shall be glad to tell you all we know.

Mr. C. N. P. PHIPPS:—I think we who are Shareholders have good cause to congratulate ourselves on the very satisfactory speeches that we have just listened to. If anything can be said to be certain of success in this world it looks really as if this Company, in which we are all interested, has a more than fair prospect of success and, let us hope, ultimate profit. I should just like, if you will allow

me—in no hostile spirit, I hope you will quite understand—to ask a few questions about the Accounts. Would it not be advisable to open a special Development Account in the same way as it is generally opened in other industrial concerns—a Capital Account, call it Development Account if you like —but have it set out by itself. Then there is another account that is also a very useful account, which I think may be worthy of consideration, and that is a Revenue Account. I may be told that unless we make a profit or actually make a loss a Revenue Accounts is not of much value. I think it would be a satisfaction to the Shareholders if we could see, and not have to wade through the accounts, what revenue is coming in each year. In the way of revenue there would be of course the coffee that we sell; and then I understand either the Chairman or Mr. Shand to say that there was a good deal of timber cut upon the land that we are now beginning to cultivate. I should like to ask: is that timber saleable timber or is it not? Of course one knows that there is a great deal of very valuable timber in Costa Rica, but at the same time one can quite understand that the timber may not be of a very valuable description. Then I should like to ask whether the sundry assets in Costa Rica, the live stock, the carts, the implements, were taken over with the property, or whether they were things that were bought afterwards, and whether that really belongs to the Development Account? I understood the Chairman to say that he did not consider perishable things as part of the Development Account? I understood the Chairman to say that he did not consider perishable things as part of the Development Account. Might I ask (I do not know whether it was that I did not follow it) whether the general expenses in Costa Rica, £396 11s 4d., are abnormally, heavy, and if we could have some idea of what has constituted the amount of £396 11s 4d? I heard the statement that was made about the Directors' fees with a good deal of pleasure, and I want here to endorse, and fully endorse, the Chairman's remarks, "that the Directors are worthy of remuneration." I am sure that none of my brother Shareholders in this room would wish that the Directors' should work for us for nothing. When I saw the accounts I noticed that the Directors' fees were on both sides of the Account, but I was rather startled at the idea of our having to pay such a very large amount as £750 a year; but that has been explained by the Chairman, and I am sure that, speaking not only for myself but also for my brother Shareholders, we appreciate extremely the feeling which has prompted the Board to recognise what our situation is.

Mr. Whitbread:—Mr. Chairman, I should like to ask one question. Have the Directors been able to make up their minds or to forecast at all what it costs per acre to bring this land under cultivation, and to what extent does the present capital of the Company enable us to go in the way of coffee planting? I quite agree with what the Chairman said; it is advisable at present to give our first attention to that. I should also like an assurance (I suppose it is hardly necessary to ask it) that the assistant who goes out to the Manager in Costa Rica will devote his immediate attention to getting the accounts in really proper order.

The Chairman:—Gentlemen, first in answer to Mr. Phipps, as to a special development account. I think the Board would probably like to confer with him. It is not very clear to my own mind at the moment what is intended. Capital account is always a little vague, and for that reason we chose development account, because we thought it best described item No. 2 on the credit side; but these headings are always subject to extension and to further division. The item in question is, as I before remarked, for fixed plant; and I think it will be dealt with, and worked off by depreciation year by year, and so brought into revenue account. Item No. 3 (Sundry Assets) are what I ventured to call wasting assets, such as live stock, carts, implements, &c. I think it would be dealt with in rather a different way, when it is ascertained how much will be required by the company of this kind of material. When it is in full working, the stocks carried forward will be treated as capital, and so the year's purchases will roughly correspond with depreciation, and will pass the revenue account. I understand that is how it will be dealt with.

Mr. Phipps:—Is it what was found on the ground—part of the vendor's stock?

The Chairman:—The whole of the goods under Item No. 3 (live stock, carts, implements) are new and purchased by the company; as far as I can understand we have taken over little or nothing of what was there before. I think I am right, Mr. Shand?

Mr. Shand:—Yes.

The Chairman:—Mr. Phipps called attention to the absence of Revenue Account. There is no such Account, because up to the present there is on Revenue beyond £186 3s 6d. The Revenue Account will be built up of Items Nos. 5, 6, and 8. No. 5 is produce in hand, No. 7 is old cultivation expenses, and No. 8 is new cultivation expenses; and of those three, with drafts from the other accounts. will be built our Revenue Account. When we next have the pleasure of meeting you, we shall have, I hope, a Revenue Account, and shall present it in proper form. The question about the timber, whether it is saleable or not, comes next. In this country we have an idea of turning everything into money, and Timber, we think, is a very valuable thing if brought to market. In Costa Rica I understand (but Mr. Phipps knows better than I do) they have a different way of dealing with the Timber. They allow it to rot on the ground, and make the manure or fertilisation for their coffee estates: and so extraordinary is the vitality of the vegetable and animal creatures that assist this fertilisation, that in a very short time these huge trees have become fertilising material and passed into the ground, so that it is a matter of consideration with the manager whether he can realise his timber as timber, or whether it is better to lay it along in lines on the ground and leave nature to do the rest and bring it into the soil. I am not able to say whether we have any quantity of saleable timber; I should think we have not, but as soon as we have we shall sell it. The other question of Mr. Phipps related to the item "General Expenses," which appeared as £396 11s 4d in Costa Rica. I say candidly that the Directors have not all the dissection of that item that they would like to have, but they have written for it, and it will come. At present it appears justified by the heavy expense the Company was at for translations and other preliminary work. The whole of this great body of Articles of Association had to be translated into Spanish and filed in the Government archives, costing a great deal of money; and this and other preliminary expenses in Costa Rica account for the large figure.

Mr. Phipps:—Might I ask one more question. Are we likely to be called on to expend very much more money on the roads?

The Chairman:—Mr. Shand has answered that as far as we can answer it. At present we know that the money is voted by the Chamber for the purpose of hardening our road, and all the influence we can bring to bear will be used in getting that money devoted promptly to the road.

Mr. Phipps:—I take it 50,000 dollars will not cover it. We shall have to make up some ourselves.

The Chairman:—£5,000 is a considerable amount. I am afraid we cannot tell you more at present. We shall do so as soon as we can. The sum that has already been expended on the road (which amounts to £32 in the account, it is £200 or £300 since the account) we feel certain we shall see back in a very short time.

Mr. Shand:—The Government will repay us.

The Chairman:—Mr. Whitbread asked three questions: as to the cultivation of the coffee, as to the acreage the Directors were intending to put under cultivation, and as to our new assistant. As regards cost of cultivation, I have Mr. Shand's assurance that he sees no reason to vary the figure he brought

home with him from Costa Rica, namely, £18 an acre for the cost of bringing rough land into coffee land. Reverting to the statement made in the prospectus that we proposed to bring 1,700 acres into cultivation under coffee at £18 an acre, any gentleman quick at figures will see that that statement will not fit in with our present capital, but we must remember that our capital has been dealt with since. We have a smaller capital than was originally contemplated, and of course we can do with a small acreage of coffee. The 1,700 acres now loom in the Directors' minds as 500 acres. About 500 acres is what the Directors at present contemplate bringing into cultivation at the earliest possible date. There you will see that the figures square with the Capital that we have in hand. If the question is asked us: Do you desire to have more Capital in hand? the Directors after due consideration will answer that question, but at present we feel we have enough Capital to do what lies before us to do, quite enough to enable us to pay a handsome dividend if our plans hold. The other question was as to the assistant that has been appointed to go out to help Mr. Rothe, in the Accounts in Costa Rica. He has been selected with the special view of managing these Accounts and sending them home month by month in the perfect form in which they come from a first-rate Ceylon estate. We believe that he is a young man capable of doing this. He is used to Accounts, and we look forward with a great deal of confidence to having our Accounts, in a very short time in a perfect and regular form, month by month.

[The Resolution was put to the meeting and carried unanimously.]

The CHAIRMAN:—The next resolution relates to our Auditors.

Mr. PHIPPS:—I have great pleasure in moving "That Messrs. McAuliffe & Davis be appointed Auditors for the current year's Account at a remuneration to be fixed by the Board.

Mr. HENDERSON seconded,

[The Resolution was put to the meeting and carried unanimously.]

The CHAIRMAN:—That terminates the business of the meeting.

Mr. WHITBREAD:—I think we ought not to separate without moving a vote of thanks to our Chairman and Directors for the work they have so far done. I hope they will find the labours in front of them easy and satisfactory.

Mr. ROBERTS seconded.

[The Resolution was put to the meeting and carried unanimously.]

The CHAIRMAN:—Answering not only for myself and my colleagues, but also for the staff, I have to express our indebtedness to you for your appreciation of our services. We shall be pleased to give in the future all the care and attention we have done in the past. It is not exactly a sinecure. We have worked very hard for the Company, the success of which we are all deeply interested in. There is no one on the Board with a small holding—we all have large holdings, and therefore we want to do our best in the interests of the Shareholders.

The proceedings then terminated.

LADY-BIRDS AND FRUITS.—A most interesting attempt is about to be made to acclimatise the lady-bird in Egypt in order to protect the fruit grown in that country from the attacks of parasitic insects. The necessary lady-birds are to be imported from New South Wales.

COCOA LOOKING UP.—There is compensation in all things. As against the fungus and its ravages, we have the price of cocoa going up; and we now read that "A large cocoa manufacturing house has adopted a new advertising scheme. They have arranged to supply all the conductors of the most popular lines of buses in London with satchels filled with sample packets of cocoa, which are to be distributed to lady passengers."

CEYLON TEA CROP ESTIMATE FOR 1898.

The official estimate of the Planters' Association has now been published. The particulars are given for each group of districts and we repeat the table here adding to it the average yield per acre where that was reported in the proceedings of the District Associations themselves:—

	Crop lb.	lb. per acre.
Ambagamuwa Association ..	5,750,500	425
Badulla do. ..	3,866,490	—
Balangoda do. ..	1,150,000	400
Dikoya do. ..	12,115,950	450
Dimbula do. ..	19,323,510	457
Dolosbage and Yakdessa Association ..	5,800,000	—
Haputale Association ..	4,000,000	394
Kalutara do. ..	6,100,000	500
Kelani Valley do. ..	13,205,000	523
Maskeliya do. ..	7,408,000	400
Maturatta and Hewahetta Association ..	4,497,200	—
Northern Districts Association ..	17,000,550	—
Nuwara Eliya do. ..	2,174,000	429
Passara do. ..	2,800,000	—
Punduloya do. ..	1,733,500	—
Pussellawa do. ..	7,993,700	409
Rakwana do. ..	1,603,000	—
Udapussellawa do. ..	3,090,000	421
Udugama do. ..	560,000	—
Native and Unestimated ..	2,000,000	—
Total ..	122,171,400	

It will be seen that Dimbula gives the largest quantity of tea in its well nigh 20 million lb. and that the highest average yield per acre—so far as estimated—appertains to the Kelani Valley. The time is approaching when some allowance will have to be made from the estimated total crop for our island consumption; but so far, perhaps the yield of native gardens not taken into account, counterbalances this requirement. The probability is that the total tea exports for 1898 will be somewhere between 120 and 124 million lb. and therefore 122 is a safe estimate, indicating shipments about 6 million lb. in advance of 1897. Again the shipments out of this total to the United Kingdom are likely to be about 103 to 104 million against 99 million lb. last year, a very limited addition indeed; while 18 to 19 million lb. are at least expected to be taken off for Australasia, North America, Russia and the rest of the Continent of Europe and all other parts. Seeing that 17 million lb. were diverted in this way from London last year, we shall be disappointed indeed, in view of all the efforts made to get well into the American and Russian markets, if less than 21 millions are required for direct shipments outside of the United Kingdom in 1898. This in fact is the estimate of Messrs. Forbes, Walker & Co., and if we take this quantity from the official estimate of crop, there would be only 101 million lb. left to go to London—a fact which if borne out, should ensure throughout the year, a good demand and steady if not better prices for Ceylon tea. In this connection we call attention to the proceedings of the "Thirty Committee" on our third page where it is mentioned that Mr. Christie is well pleased with the prospects of Ceylon tea in Russia, and still more to the contract entered into with Mr. H. H. Davies of Messrs. Peek Brothers & Winch Ld. by which an expenditure of £1,000 in advertising Ceylon tea in Russia is ensured. We should like to see a native Russian Firm undertaking this duty as well, in consideration of a grant. Perhaps Mr. Christie may show the way to attain that result.

TEA ESTATE EXPENDITURE.

"IS THERE ROOM FOR ECONOMISING?"

The above question we find is being seriously asked in Agency and Estate Inspecting circles. "Is enough work being got out of the well-paid labour force?" is the more immediate form of enquiry, and comparisons unfavourable to the present time are made with the era of coffee and with the early days of tea. It is said—with how much truth we know not—that the big wave of prosperity which came in about ten years ago relaxed the care, efficiency and economy of estate working in far too many instances and that there is urgent need now for harking back and returning to the old style and quantity of work. This is, however, we suspect more easily said than carried out. Where there has been a relaxation of the close scrutiny and continuous work distinguishing the hard times of a past decade, the explanation may perhaps be found in the increasing scarcity of coolies and the greater difficulty of keeping them contented and permanently settled. If putting extra pressure to secure more work, leads to a demand for "tundus," the latter state of that plantation and Superintendent may be worse than the first. Still, we are apparently entering on a year likely to be distinguished by an abundant supply of labour, and that should just be the season for attempting to work back to the old methods where it is felt there has been undue relaxation, slackness or extravagance. In this connection we are reminded of the trouble which has arisen at the Straits through the poor prospects of Liberian Coffee. Early in January, a Straits contemporary published a very gloomy account from the pen of an experienced planter, of the outlook for Liberian Coffee in Malaya: he threatened certain weak estates with going to the wall altogether and declared that the only way for the better estates to cope with declining prices was by reforming "the hours of labour." After a dark picture of the approaching crisis, the writer, evidently an ex-Ceylon planter, deals as follows with the economy which he deems essential:—

The most practicable economy that I know of is the changing of the working hours from 6 a.m. to 2 p.m., as at present, to from 6 a.m. to 10-30 a.m. and, again, in the evening from 1-30 p.m. to 5-30 p.m. giving the coolies, conductors, and superintendent three hours' rest in the heat of the day. It is a well known fact that, when the superintendent goes home for breakfast, the coolies sit down under the coffee trees. Then, why not have them in their lines where they can also get a good meal, and go out fresh in the cool of the evening. I positively state now that I have proved that I can get 30 per cent more out of my labour in this way: and I ask any superintendent whether he feels very fit to look after his work in a burning sun after a heavy meal and "perhaps" a bottle of beer. I want two hours rest at least, and so does any other man, and, what is more, most of them take it. This question was brought before the Selangor Planters' Association a few days ago, and it required the casting vote of the chairman to decide against the motion for working morning and evening. Many men there who voted against it stated that they knew it was the best thing to do. One man said his lines were too far away; he was a cricketer. Another man said rain came on in the evening; therefore, he would vote against the change; he was a golfer. Another said his coolies would not turn out again; he was a player of some other game. So a good motion was lost; a change that would save the proprietors of estates 30 per cent on the labour expenditure and halve their bills for doctors and medicine. In the face of the labour difficulty, individual estates cannot make the change unless it were made general: but, if two-thirds of the estates agreed to make the change, it could be done, and some of the others, who are now against it, might be made to do it. Once a week is quite enough for a man to get away to his club and his golf, and any man who has not the interest of the estate at heart enough to make him walk round it in the evenings, whether his coolies are working or not, is not the sort of planter we used to know in Ceylon.

We do not think the system condemned above has any parallel in Ceylon: tea pluckers certainly do not end their day's work here at 2 P.M. and the hours altogether in our tea districts are regulated after a more satisfactory fashion than in the Straits. But still, that there is room here as in the Straits, for the application of economy in one shape or other, cannot be denied at least in a considerable number of cases. Not many of our working planters now, perhaps, can recall the dark days of 1866 which followed on "black Friday," the fall of Overend Gurney & Co., in London; but those who do will remember the valuable discussion on "Estate Expenditure" which resulted. A mere selection filled some sixty pages of our "Handbook" and in a final summing-up, Mr. George Wall showed in detail how between 1849-55 and 1862-5, estate expenditure had increased 54 per cent, the cost (per cwt. of coffee) of "cooly work" having risen from 12s 11·2d to 19s 4·1d and the average rate of coolies' pay including kanganies from 7·46d to 8·56d, while 27·7 days of a cooly were required for each cwt. where 20·8 days' labour had sufficed in the earlier period! Nor must it be supposed that crops had fallen off—the average rather having risen in this period from 5·8 cwt. to 6·2 cwt. of coffee per acre. Among other preliminary steps that gave a practical turn to the discussion of 1866, was the offer of two prizes by the Planters' Association for the best (first and second) Essays. These were won by Mr. P. D. Millie and E. Woodhouse and the heading of both ran:—

MR. MILLIES ESSAY.

The following remarks on increased expenditure on estates, its causes and remedy, may be confined to two general headings:—

1st.—On Increased General Expenditure.

2nd.—On Increased Expenditure connected with Coolie Labor.

MR. WOODHOUSE'S ESSAY.

"*To be or not to be, that is the question.*"—*Hamlet.*

"The causes of the great increase of Expenditure on Coffee estates, and the means to be adopted for reducing it."

Can it be said that our Tea Enterprise has existed long enough to warrant the expectation of useful Essays if prizes are now offered? If there is a pressing need for economy in certain directions and if Colombo Merchants, Agents and Estate Inspectors feel that a marked change for the worse has gradually crept in, then we say there ought to be considerable scope for enquiry, reflection and practical suggestions towards reform as would warrant a call for Prize Essays. Much happens in a dozen years in a colony like Ceylon and with a tropical cultivation like that of coffee and tea. Now, Mr. Wall's comparison in 1866 only covered a period of ten to thirteen years; yet the result was eminently beneficial. The tea industry of Ceylon may be said to have begun with 1,080 acres planted in 1875; but in 1885 this had grown to 102,000 acres and by 1895 we had 305,000 acres planted out. Now, we suppose the returns for 1898 (which

are rapidly coming in for our "Directory") will show a total not far, if at all, short of 400,000 acres! Surely then, the interval between 18·5 and the present year must cover much and varied experience which it would be well to bring into review. A comparison between 1885-7 and 1895-7 if undertaken after the pattern we have indicated, should give ample scope to a practical and well-informed Essayist who could perhaps tell us how Tea Estate Expenditure has increased, is increasing and how it can and ought to be diminished.

SHIPPING FRUIT.

A scheme by a Colorado man is founded on the principle that dry, fresh air is far more beneficial to fruit in transit than is the moist and confined air of a refrigerator car. In the new car, ice is done away with. An immense metal funnel is attached to the engine of a train, just above the pilot, and from this funnel a pipe, about 1 foot in diameter, extends back to the fruit-car, resulting in an automatic draught of air flowing through the car. This, it is claimed, makes a perfect ventilation, and according to the dry-air theory, will preserve fruit for several days longer than the ice process.—*Queensland Agricultural Journal*, January.

AMOUNT OF BARBED WIRE REQUIRED FOR FENCES.

The estimated number of pounds of barbed wire required to fence the spaces or distances mentioned with one, two, or three lines of wire, based upon each pound of wire measuring one rod (16½ feet), is as under:—

	1 Line.	2 Lines.	3 Lines.
	lb.	lb.	lb.
1 square acre ...	50⅔	101⅓	152
1 side of a square acre	12⅔	25⅓	38
1 square half-acre ..	36	72	108
1 square mile ..	1,280	2,564	3,840
1 side of a square mile	320	640	960
1 rod in length ..	1	2	3
100 rods in length ..	100	200	300
100 feet in length ..	6 1-16th	12⅛	18 3-16th

—*Queensland Agricultural Journal*, January.

THE PRODUCTION OF COCAINE.

To B. and C. "Druggist."

Dear Sir,—I have read with interest of the new enterprise encouraged in the Madras Presidency with regard to the cultivation of coca leaves for cocaine manufacture.

There is, as a fact, quite sufficient supply for the demand of cocaine as it stands, but what I fear is that the present demand will not develop, but rather recede, because cocaine is produced synthetically at less money than the lowest yet known cost of cocaine.

What is also a very important factor in the future of cocaine is that the synthetic cocaine, named eucaine, has far less toxicity than cocaine. This fact, combined with equal efficiency, should make a Government department very cautious. I say so, because I notice that the sale of eucaine is fast increasing.—Yours very truly,

AUG. ZIMMERMANN.

9 and 10, St. Mary-at-Hill, London, E. C.,
January 7th, 1898.

[We gladly publish the above letter from Mr. Zimmermann, who is in an advantageous position for speaking on the sale of cocaine and eucaine. At the same time, it is only fair to point out that eucaine is a special product of Scherings, for which well-known house Mr. Zimmermann's firm are agents. Independent observers, however, have declared that eucaine has certain advantages over cocaine. Schmidt says that it is less toxic than the latter. On the other hand, he says that its local anæsthetic effect is inferior to that of cocaine (See B.&C D. "Review of the Year") One well-known house has recently introduced to medicine a combination of bocaine and eucaine for the purpose of uniting the advantages and overcoming the disadvantages of each body.]

DURIAN SEED.

Our old friend, Dato Meldrum, writes from Johor Bharu, near Singapore, Jan. 25:—

I have sent per post (registered) to you some Durian seeds. They are of the finest sort, off a tree near the "Hall," which I planted myself perhaps 25 years ago. I wish you could only taste and try: the flavour is exquisite: Monsieur Soyer never concocted a custard to equal it—delicious is not the word—*tres superior?* No! better than that—indeed, the English language does not furnish an equivalent word to express the extreme delight and pleasurable satisfaction one derives from a full mouthful of this transcendent fruit—it is beautiful! it is magnifique!! it is "ver good"!!! The odour—but no, I shall not allude to it—I have been to Cologne! the "goose dubs"!! and other salubrious places—yes, the less said regarding the odour, the better for weak or squeamish stomachs. Joking apart, the seeds I send are well worth careful planting and tendency. One branch of the tree broke with the weight of 40 young durians, causing weeping and wailing amongst our Malay servants, who always manage to secure their full share of the fruit. "Durio Zibethinus." The Durian should ripen on the tree; and unless one gets a properly ripened one at first, dislike and perhaps a "scunner" is taken to this queen of fruits—ever afterwards. Only the finest seeds should be planted such as I have sent to you. John Crawford, F.R.S., in his "Dictionary of the Indian Islands," &c., gives some information regarding the Durian.

HOW TO MEASURE AN ACRE.

Farmers would often be glad to know the area of oddly-shaped fields without having recourse to a surveyor. The following may prove of some use:—Five yards wide by 988 yards long contains one acre; 10 yards wide by 484 yards long contains one acre; 40 yards wide by 121 yards long contains one acre; 70 yards wide by 69½ yards long contains one acre; 80 yards wide by 60½ yards long contains one acre; 60 feet wide by 726 feet long contains one acre; 110 feet wide by 397 feet long contains one acre; 130 feet wide by 363 feet long contains one acre; 220 feet wide by 181½ feet long contains one acre; 440 feet wide by 99 feet long contains one acre.—*Queensland Agricultural Journal*, January.

CEYLON TEA IN RUSSIA: MR. T. N. CHRISTIE'S REPORT.

The long and instructive Report which will be found on another page is, by no means so encouraging as was anticipated. The difficulties in the way of spreading a taste for Ceylon tea in Russia are very considerable, while no less are the obstacles to the promotion of trade. Mr. Christie goes fully into particulars bearing on this department, and the darker he draws the picture of official interference at every turn, of prohibitory duties, &c., the more, of course, Mr. Rogivue and his work stand out in relief; but we are rather surprised Mr. Christie did not try to find out what other large tea dealers—Lipton for instance—were doing. Eighteen months ago we saw in the London City Road warehouse, a very considerable consignment of tea ready for shipment to St. Petersburg, and we were told that the progress made by the new Agency in Russia was most encouraging. Then again we should have liked to see a big Russian tea house—like the Popoff's—sounded as to what they could do for Ceylon

tea by way of advertising, if the Planters' Association placed a grant, say, of £2,000 at their command? To enlist the interest of Russian tea firms would be a great matter. Mr. Christie gives us particulars respecting the Consuls who assisted him and Colonel Stewart's connection with Ceylon is specially interesting. There was also an officer of the Argyll and Sutherland Highlanders who left Ceylon to settle at Odessa as Vice-Consul. The varying and heavy differential duties show how terribly our staple is weighted in Russia; but there is certainly a good case for a Memorial to try and get the import duty by sea and land made uniform at 1/2½ per lb. (so getting rid of the prohibitory 1s 10½d duty). To try and get the import duty reduced is Mr. Christie's first recommendation. His second and third we should be inclined to couple together; for surely it would in a manner be benefiting all retail dealers who handled Ceylon teas, to advertise their merits. Altogether Mr. Christie gives us a very useful and suggestive Report and one that may mark a new era in our Russian Tea Campaign. It will be observed that he is emphatic in his commendation of Mr. Rogivue's operations in the past on behalf of our teas, and we have no fear that the Rogivue Company will not benefit Ceylon as well as Indian teas.

THE HAPUTALE PLANTERS' ASSOCIATION.

How is it that Haputale with about the richest soil of any planting district in the island, is behind, comparatively, in its average yield of tea per acre? The total estimated crop for the current year is 4 million lb. from 10,154 acres in bearing—total acreage 14,355—or an average of 394 lb. A return of practically 400 lb. an acre with good prices, is of course very satisfactory; but we dare say it is going to be with tea as it was with coffee, that the older it gets in certain parts of Uva, and especially Haputale, up to 10 or 15 years, the better and richer in crop, it becomes. At the same time we recognise the fact that Haputale and Uva generally, would do with some more rain for tea, although it is wonderful what the heavy dews peculiar to the Principality, give in flushes of Tea. Alas poor Coffee!—even in its most favoured home in our hill-country, it is rapidly becoming a thing of the past. What about Cacao, Cardamoms and Rubber? Haputale had an appreciable acreage in 1895 of all three products, and surely with its fine soil and sheltered valleys, some of these new products ought to do as well as in the Northern Districts? Let Mr. Bisset and Mr. Bethune, during 1898 give us a "crumb of comfort" in regard to new, even if very minor products. We had fain hoped to see Uva developing a goodly acreage of cacao. Roads and Labour Supply are by no means perfect, but the Association has faith in the Labour Federation as a means of amelioration in regard to the latter. A good deal of further useful business was transacted; but the special feature of the meeting was the adoption of the Resolution moved by Mr. Bethune, seconded by Mr. Lloyd—both experienced, thoughtful and responsible members of the planting community,—in favour of a Commission to inquire into the feasibleness of a separate Ceylon Coinage and Currency. This is a very complicated question indeed; and we fear now with the Straits on the one side voting for a Gold Standard, and India striving after the same result on the other, that it will not be easy for Ceylon to go in a silver direction. However, a Commission of Enquiry may make the matter clear, and cannot possibly do harm.

PRESERVING FRUIT.

It is perhaps not widely known that fruit may be preserved without boiling, heating, or drying. All that is necessary is to alternate the fruit between layers of sugar. The sugar, however, must exceed the weight of fruit by one-half.—*Queensland Agricultural Journal*, January.

PLANTING NOTES.

COFFEE IN NETHERLANDS INDIA.—I returned from Port Darwin on 29th November last: *en route* I called at Timor Deli—the Portuguese have had part of the island for more than 200 years—found the place dull; no progress; Government on the one hand and the priest on the other keep the people down, poor and ignorant. One year, a while ago, 30,000 piculs of coffee were exported, mostly to Batavia, where it is said the Dutch mixed it with something inferior.—*Cor.*

TEA PACKING.—The following remarks are from the London Correspondent of the *Indian Planters' Gazette*:—

Looking over samples in a broker's office the other day, some teas struck me as selling considerably above their value. In reply to my query the broker said, "but they have such a good aroma, that fine malty-burnt which you so seldom get now," which remark led to a discussion on the firing question. He said there was no doubt teas generally were fired at too high a temperature, and, consequently, to avoid burning, were not thoroughly done, from which resulted want of keeping power, and much of the dull flat smelling teas met with in the market. I have no doubt there is much truth in this, and teas would arrive in more satisfactory condition if at least the latter part of the firing, as well as the final firing, was done at a much lower temperature than is the usual custom. To do this thoroughly in all cases means a larger consumption of fuel, and in many factories would also require more drying machinery, but it would, I believe, amply repay the expenditure. From this we went on to discuss packing, and he said, "An old planter was saying to me the other day:—'I was always careful to solder in my tea hot.'" My reply to this was that I was afraid many more were not sufficiently careful not to pack or solder their teas before they were nearly cool, as so long as the tea is hot it continues to give out moisture, and it should be allowed to come within not many degrees of the atmosphere before it is packed. I have not experimented on this myself, but I would advise some of your readers to try the experiment of packing one chest as it comes off the fire at say 240°, and another when the tea has cooled down to about 100°, and opening them some days afterwards to see which tea seemed in the better condition. Since I had this conversation with my broker friend, a dealer has been asking my opinion on the same subject; as he often found some damaged tea on the top of the chest, though the rest of it was in good order, and this he attributed "to the tea sweating when packed hot." The importance of the subject must be my excuse for drawing attention to it, as though practical planters must know more about it than we in London can do, yet there is doubtless difference of practice, if not of opinion, amongst them, as how both firing and packing can best be done. In a previous letter I drew attention to the question of bulking and the necessity of even packing, as well as even mixing if the tea was to pass without rebulking here, so need not refer to this today. Mr. Lipton is said to still continue buying only London bulked teas, but I do not think many others are following his example.

Currency, Dear Money, Finance and Trade in India.

A LEADING CALCUTTA MERCHANT SPEAKS OUT TO SOME PURPOSE :—

"INDIA'S GREAT CURRENCY PROBLEM CAN BE SOLVED BY OUR FIELDS AND BY HER LOOMS AND BY THEM ALONE."

———

After referring to the Bank Accounts, (at the annual meeting of the Calcutta Bank Limited Jan. 28th) Mr. DAVID YULE as Chairman said :—

As you will remember, money was very stringent during the first half of the year, but as soon as July was reached, a much easier feeling was experienced, and employment for funds at profitable rates became, weekly, more difficult to find. Although a glance at the record of the official Bank rate does not indicate that money was too plentiful, it is nevertheless a fact that accommodation was available on short notice at 3 per cent below the official minimnm. While strongly of opinion ourselves that the drop in the open market was not warranted by the real state of the currency, the persistent way in which money was, so to speak, thrown at their heads, induced many people to believe that the burden of tight money had been removed, and that they might enter into fresh transactions without fear of this disturbing influence in future. The mistake of trusting too much to the temporary depression cannot but be the cause of serious inconvenience now, and until this recent lesson be forgotten, borroweis will be inclined to accept the official Bank rate as a guide to their financial operations in preference to the illusiveness of Burra Bazaar. It is, however, interesting to know that the reason of the divergence between the two rates was, in great measure, due to native capital, previously employed in the financing of piece-goods and produce, seeking re-investment in new channels. This brought native capitalists more openly than has been customary into competition with the Presidency and other Banks. Piece-goods and produce dealers have not done well some months past, and many of them have lost the margin of security which alone commended them as borrowers. There is, I regret to say, no hopeful featnre in their trade, which dealers can point to as an inducement to their bankers to renew advances. The piece goods market has been upset by the vagaries of exchange, and stocks have accumulated owing to the failure of the retail demand, through poor crops and the general impoverished condition of the masses. As regards produce, the influences of anticipated large crops and glutted consuming markets have justified great caution being exercised in making advances.

SPECULATION ENCOURAGED.

The resnlt of the nnwillingness of bazaar capitalists to provide, as had been their custom, for these branches of trade, was to create a strong speculative movement in the Shares of Joint Stock Companies and in Government Secnrities. Prices of some of the former advanced 40 per cent, and stocks, which previously were unsaleable, became freely inquired for, while the market absorbed readily the new Government 3½ per cent loan of 300 lakhs at the comparatively high rate of 98¾ per cent, besides relieving holders of Indian Government Paper in Europe to the extent of about 425 lakhs. So far as can be seen at present, the money put into circulation in these directions is likely to remain locked up for some months, and, although the men who are providing the funds to carry over the heavy indebtedness, from month to month, are well able to look after their own interests, and invariably do so, borrowers are feeling acutely the change that has so suddenly come over the market. What their position is may be inferred from the fact that Banks have been unable to advance against Government Paper, with full margin, at 13 per cent. It is not surprising that there has been a sharp fall in the value of all securities, and the tendency appears to be still downwards. A source of weakness is that so much of the burden is carried by native capitalists, who are not accustomed to the transitory periods of depression which overtake the stock market.

RUPEES ARE NOT REMITTED.

There seems to be an impression, shared in by the Finance Minister, that the stringency of the money market is due, in great measure, to the withdrawal of European capital which had been employed for banking purposes in India. This transfer of capital indicates the existence of a want of confidence either in the prosperity or security of the country or in the ability of the present currency policy to maintain a favourable rate of exchange, but the transfer does not affect the number of rupees in currency, as it does not take the shape of a shipment of rupees. If A remits £100 to London, he pays over his rupees to B who wishes to transfer a similar amount in sterling to India. Such a transaction can have no power to increase the stringency of the Indian money market, unless the rupees A parted with are withdrawn from useful circulation by B. There is no evidence that the market has been deprived of the use of such rupees. On the other hand, it must be admitted that, had rupees not been released from hoards, since the closing of the mints, trade would have suffered even more severely than it has done for want of coin. The causes of the stringency must be looked for in the many directions in which it is possible for rupees to disappear from circulation. Besides these we have to take into account such factors in this question as the growth of population, the extension of industries and of railway communication, all of which tend, by opening out the country, to disperse rupees more widely from the centres of circulation. As you are aware, the lifeblood of the currency policy of 1893 depends wholly on the scarcity of rupees, and so surely as December comes round once a year, will the period of dear money return. If money this year gets cheaper before the end of June, the fact may safely be taken as a sign of a falling-off in the trade activity of the country.

FANCIFUL VS. ACTUAL CALCULATIONS.

At the meeting of the Legislative Council on 14th instant the mercantile member produced a statement to show the amount of money that would have been saved by Government if the rupee had been maintained at 1s 4d during the financial years of 1894-95, 1895-96, and 1896-97. The inference is that the saving not having been made, Government had lost, or become poorer, by the sum of R1,192 lakhs, or (at exchange 1s 4d) £7,945,733. This calculation I regard as an altogether fanciful one, for there are many items which would have tended to reduce the saving, if not wholly to dissipate it, had Government been powerful enough, I will not say they did not try, to screw exchange up to 1s 4d, in spite of the conditions of trade which operated to make the actual rates what they were. While on the subject of this calculation, another one more interesting suggests itself to me, and that is the loss that holders of Government Rupee Paper have suffered, during the past six monts, through the currency policy, or the pecuniary difficulties of Government. It would be well to compare it with the calculation before referred to—Government's loss in 3 years, 1,192 lakhs, equal to £7,944,733; holders of Rupee Paper loss *in six months*, 646 lakhs, equal to £4,310,833! I do not claim that there is any connection between the two calculations. I merely wish to point out that there are some losses about which we hear very little but which are even more important than that of the Government's loss by exchange. The difference between the two calculations is that one is fanciful, while the other is actual, as any one who held Government 3½ per cent Paper on 1st July last, and wishes to dispose of it now, can have practical demonstration of. Poor India has many evils to contend against, and very few of them are enquired into and redressed. It is a very curious thing, however, that the Government's loss by exchange is constantly the subject of complaint and commiseration. Folios of the annual budget are devoted to the subject. The Empire appears to b wholly in the power of this distressing item, althoug

other preventible charges are greater, and have served no more useful purpose. Short rainfall, bad harvests, floods, fires, earthquakes, and other misfortunes affect the welfare of the people, and such calamities will, no doubt, recur from time to time, but so far no public meetings have been called to pray for legislation to stop the loss which they occasion, or to make those who do not suffer pay up for those who do. Such losses are regarded as not preventible and are borne resignedly. Loss by exchange, however, has come to be regarded, by Government officials particularly, as a preventible loss, which must be avoided at any price. The Government in endeavouring to get quit of the loss by exchange at this stage of the country's progress, are not a whit more reasonable than the directors of a steamship company would be in giving orders to their Commander to leave no room for the coal, but fill the space up with cargo, and then expect the steamer to proceed on its journey. No matter how the Government may avoid this loss in their accounts, the people of the country have got to pay the bill, and the bill comes to a great deal more than the saving to Government. I am quite sure that the Secretary of State had no conception of the harm that would be wrought by the closing of the mints. The course of starvation which had to be adopted to bring the rupee into subjection was not explained, or was not contemplated, by the authors of the policy. The measure was ostensibly to prevent the further fall of the rupee, but the Government have, instead, striven to raise the value to a point at which it cannot remain without breaking the backbone of the country, which is its trade.

It is this desperate ambition to have 1s 4d exchange, at any sacrifice that has wrought

THE FAILURE OF THE CURRENCY LEGISLATION OF 1893.

and brought the people to the verge of ruin and discontent. What confidence can there be in a policy that buys rupees for 1s 4 1-32d and sells them a few days after at 1s 3 1-32d or declares that a limited amount of Telegraphic Transfer will be sold out of the 40 lakhs Councils offered and two weeks after sells the whole amount in that form! Can any business man have the patience to anticipate such vagaries, or to believe that they are working for the common good of the country? I think not. It is evident, too, that the Government have lost confidence in their ability to prevent fluctuations in exchange, and to maintain the rate at 1s 4d without utterly upsetting their revenues. The condition into which India has fallen may be gathered from a few words which fell from the Finance Minister's lips on 14th instant. He said:—"It must be understood that we are not rolling in wealth while we are refusing aid to others, and our inability to advance money is due, not to any wilful obstinacy, but to want of adequate means. The Secretary of State cannot draw on us for more than we are able to pay. The fear is, threfore, that the market may reach a point where money will become actually unavailable, and merchants will find it impossible to sell their bills." The Government claim the right to do what every sound trader does, but it strikes me that a sound trader could not expect to get assistance on such a statement of his accounts. There was, therefore, not much prospect of the Indian Paper Currency Act of 1898 which came into force on the 21st instant being of much help to the people. Its intention is to give relief in cases of dire necessity by allowing for the speedy introduction of foreign capital to the country. Council wire and bills might, at any time, be insufficient to meet the demand for money, and a panic would ensue were no other means available to get a supply of coin. It must be assumed that before the benefit of this Act could be taken advantage of by the people, the greatest measure of confidence would be required by the parties whose gold is to give the relief. There was not one word of encouragement given. "The Government did not know, and perhaps they need not care, whether the facility would actually be availed of or not." That was all. To know that there was a life-boat on the east coast of Scotland would give as much prospect of rescue to a sailor drowning in the Hooghly. The Exchange Banks, it is admitted, are not benevolent institutions, and are not likely to pay 1s. 4 5-32d. in gold in London to get one rupee here, unless their way is clear to make a profit on the transaction. The Banks' position is such that they do not require accommodation of the sort for their own safety, and they assuredly do not intend to sell their gold for rupees at the topmost limit of the market until they first have the definite promise of mercantile bills at a covering rate. Exporters, in the same way, are not endowed with surplus charity, and are content to sit idle, rather than by produce, payment of which has to be negotiated at the maximum rate of exchange. The result is that prices of produce are driven down in the Indian markets until the level of security for the exporters is reached. This is what is happening today with all Indian produce, now in season, as sellers of indigo, jute, cotton, tea, gunny bags, cotton yarns, and other articles can tell you.

IS THE GOVERNMENT BLIND TO THE CONSEQUENCE.

Is it possible that the Government of India see no danger to their revenues if such a state of things be allowed to continue? Do they still persist in holding that this country, as a whole, makes no loss in its international trade by an appreciation of its standard, since the lower price received for its exports is balanced by the lower price paid for its imports? The fallacy of this theory in its application to India, needs no better illustration than what is happening in our maakets for export produce, the condition of which I have just described. How long can growers go on accepting fewer rupees for their produce while they have to pay the same rent, the same wages, and taxes with an increasing burden of debt at an increasing rate of interest? How long will the money-lenders suffer repayment of their advances to fall into arrear? The agricultural population of this country display great, even dogged patience at their toil, but the money-lenders have the doggedness without the patience. The village grogshop harbours the result—a dissolute and heart-broken peasant, once a thriving ryot. His loss to the land is the loss of revenue to Government, for the people cannot continue to cultivate land which gives no return. As a practical illustration of the effect of stringent money and depressed prices, I am informed by some of the largest indigo producers in the North-West that they will not sow next season. The land thus released may not be cultivated, for other products are about as profitless as indigo.

MANUFACTURES HAMPERED.

It is not in agricultural pursuits alone that the stringency of money is felt. Manufacturing industries are hampered in their operations by the inability or unwillingness of bankers to advance funds either for further extensions or for the purchase of raw material. The manufacturer to get money has, therefore, to dispose of his goods as he makes them at the best price the market will pay for them. Importers, too, have cause for complaint, for buyers take delivery of goods only under compulsion owing to the absence of demand in retail. The fact is, the masses are unable to buy to the same extent as when money was cheap and plentiful. They have barely sufficient to purchase the food required to keep body and sold together. Comforts, such as new cloths, are out of the question. Some amelioration of the lot of the people is required, for nothing is so disposed to make a man discontented and rebellious as the stoppage of the wherewithal to buy these little comforts, which give some colour to the dull grey monotony of an Indian workman's existence. Lancashire men are quite aware that an artificial rate of exchange has done endless damage to their cotton piece-goods and yarn trades. Bimetallism for India is now the cry of these competitors with the Indian cotton mills, their rapacity is not satisfied with a 1s 4d rupee. It was believed that the Government of India would readily tumble into the trap that was laid for them by the enthusiasts of France and America, but as the records of currency literature show, the attempt to raise the rupee to 1s 11d was promptly refused. There

is now an excellent opportunity to make another calculaton to show what saving Government would have effected if they had accepted the terms proposed. There is no rule, however, by which appetites are controlled, and it is difficult to understand why the meeting of the home expenditure at 1s 11d exchange, is not indefinitely more advantageous to the Government than a rate which varies between 1s 2d and 1s 4d. The irritability of the digestion which rejects the solid feeding obtainable for 13d in favour of an unhealthy and irregular repast at 16d might have been expected to be relieved when the Parisian treat at 23d was displayed. The Government of India have forgotten that one of the objects they had in view when the mints were closed, was to force international bimetalism.

NEW STANDARD AIDS.

In not accepting the Paris and American banquet the Government shewed good taste, as it certainly would not have looked well to display a leaning towards extravagance, while funds were so low in India. The Goverenment have, however, explained their reluctance to have anything to do with the tempting advances made by America and France, and no true friend of India will, for a moment, believe that this decision was other than a wise one. The explanation given is, of course, not quite logical, but the experience of the past four aud-a-half years is enough to show how disastrous the result of meddling with the standard of value, even to a minor extent. The consideration which has been given to this proposal and the arguments which have been adduced to show that it was better for India to hold aloof from its adoption, will, I trust, influence the Government to give back to the country the prosperity it enjoyed prior to 1893. That a great advance has been made in respect of our Indian currency, in the direction it was contemplated by the authors of the policy of 1893, is no doubt true, for rupees in circulation at trade centres have been reduced much below requirements, and India is now ripe either for a future experiment in making wealth exist by legislative enactment or for retracing the steps which have led to so much or inconvenience and loss. The belief is gaining ground that the Government are not prepared to rectify the blunder of 1893, until they attempt to inaugurate a system for making the rupee currency convertible, and some colour is given to the report by the statement of the Finance Minister that public and official opinion in England has been prepared for the possible necessity of a measure which may involve the actual diversion for Indian puposes of a certain amount of gold from the general available stock. The Finance Minister, however, was unable to give a final reply, as to the precise measures to be undertaken, as the matter was under consideration, and it was impossible at the present time to make any definite announcement. From this, it may be referred that India may yet be involved in another experiment, which even though there be sufficient gold at its back to carry it to a successful issue, must, in the meantime, cause further disturbance to trade. It is but a few months ago that the Bank of Engand rate was raised to four per cent on the mere apprehension that gold might be withdrawn from the Bank of Japan, and there can be no doubt that the tendency is towards a higher rate of interest in England. The annual cost of a conversion fund in gold, sufficient to meet all possible demands on it, must be very heavy, and would in itself be a considerable tax on the Indian rate-payer, apart altogether from the enormous gold indebtedness which has already been incurred, and which, so long as the present currency policy lasts, cannot but increase. The late Finance Minister estimated that to establish an effective gold currency £77,000,000 would be required, and I think, he afterwards stated that for a conversion fund £15,000,000 or 1-5th of the rupee coinage in active circulation would be wanted. The estimate of £77,000,000 for the gold currency was based on the belief that there were in 1892, 115 crores of rupess in active circulation; the mints accounts show that in all 355 crores have been coined. There is no doubt whatever that the great danger to the convertibility of the rupee lies in the certainty of the hoarded or dormant rupees coming in for exchange. Another factor, which must not be lost sight of, is the rupees which have been, and may be, coined by the people themselves unknown to the Government and to the impossibility of preventing coinage in the native and neighbourfng hill states. The demand for gold for India's purposes would most assuredly cause a further fall in silver bullion, and the manufacture of spurious rupees would become thereby all the more profitable, although the profits on this nefarious trade are now enormous. It must be remembered that so long as the rupees contain the required fineness of silver, the Indian public does not regard the coiner as one who inflicts loss on them. Very few will inform against him, he is an enemy to the state but not to society. So long as that is the case he is safe from interference; and when money is stringent and rupees are denied by the Government, the coiner's trade is probably looked upon, by his neighbours, as a very necessary one.

THE DANGER OF TRYING GOLD.

The assertion that the machinery for the convertibility of the rupee would be automatic, I do not for one moment believe. The Indians' love for gold is well-known, and they would, knowing the poor success that has attended the Government's efforts to maintain the gold value of the rupee in the past, not miss the opportunity of at once exchanging their silver while it was possible to do so at an advantageous rate. The ratio fixed at the outset of the new policy by Government would be regarded by the people as the maximum value of silver rupees as compared with gold. Rightly so; it would be quixotic to espect any change in favour of rupees. To defer making the exchange for gold wonld endanger, not benefit, the position of holders of rupees. To leave out of the calculation, when determining the amount of the gold conversion fund required, the hoarded and spurious rupees, would undoubtedly involve the failure of the system as soon as it came into force. The experience of the past should convince the Government that in a scheme of the sort, it is absolutely essential in the first place, to establish confidence in their power to carry out what they under take to do. This confidence could only be established by having a stock of gold of sufficient magnitude to meet at possible demands on it. Not only must the ability of Government to carry out their promises, under ordinary trade conditions, be undoubted, but they must be perpared at all times to meet a sudden run on the fund. A thoughtless word spoken in the bazaar might any day lead to a panic, and no considerations of the effect upon trade would restrain the rush that would ensue for gold. Rupees would appear from most unexpected quarters, and the demand would not be satisfied until the last available rupee was exchaged. What the effect on the money market would be can well be imagined. A movement for this sort would probably be engineered by men like the gold dealers of Bombay, whose operations have practically controlled the course of sterling exchange during the past year. Were the gold supply to fail, the rupee would fall to a lower point than it has touched before, and the credit of the Government would be, to use a mild expression, very seriously injured.

I do not deny that a machine to save the loss by exchange and to remedy the evils which have arisen from the 1893 policy is required. £10,000,000 would not be too much to pay for it. The purchase might have been made some years ago had the Government placed any reliance on its efficacy, for the contrivance was on view before the mints were closed, and its action was explained by two of the members of the Indian Finance Committee. The Government elected, however, to try the most likely tool first. They have done so, and it has failed. The coming one may do the work, it is more likely to break down, but will

in the meantime serve to carry on a mistaken policy. I have said that the first cost of the machinery would be cheap at £10 millions. The late Finance Minister thought it might require £15 millions, other experts have not committed themselves by naming any figure. They went no further than stating that the quantity of gold put down must be substantial. A business man, I think, would come to the conclusion that not less than the full equivalent of the hoarded rupees, one-half of the exported, something for the spurious and a quarter of the rupees in active circulation, would he sufficient—in round figures about £70 millions. The mint estimate of the gold in circulation in the United Kingdom is £91 millions, so that our friends in Lombard Street would have some little difficulty in providing the accommodation we seek. I fancy both public and official opinion would be found in a very unprepared condition to receive our order. I am afraid £10 million is about as much as India could afford to borrow for the purpose of rupee convertibility at present The Finance Minister is in immediate want of the sum to meet payments in London, and on the principle that charity hegins aa home, he would, no doubt, put the capability of the machinery to test, by being himself the first and only customer for the gold. Those who cannot put their rupees in the slot, might occupy themselves by considering to what extent the diminution in balance of trade has during the past few months interfered, and will continue to interfere with the sale of Council Bills, and what period of time must elapse before the rupees in the treasury reserves are melted down and sold in the form of silver bullion to meet current sterling expenditure. It may be interesting at this point to look hack and examine the condition of India and Indian trade in 1892 before the closing of the mints. We find that the revenue was expected to be 249 lakhs more than anticipated in March, 1891. The losses due to the decline in exchange and the falling-off in land revenue were nearly made good hy the remarkable improvement in railway revenue and by the increase under most of the heads of revenue. The increases were ascribed hy the Finance Minister to the "general progress of the country."

CHEAP SILVER MEANS PROSPERITY IN INDIA.

Sir Richard Temple, who must be credited with having a wide experience of India, in referring to this Budget in the House of Commons on 17th June, 1892, is reported to have said:—

"I have heard many such statements delivered in this House, but have never heard one which has given me greater confidence in the future of Indian Finance, despite all sinister anticipations. Nothing could tend more to inspire confidence in the stability of Indian Finance than the fact that, despite the enormous disadvantages which have to he contended with, there is still a surplus. The Revenue has not only been maintained but it has gone on increasing. There is ample evidence of the good financial management of the country, and of the most satisfactory features of that management is that great progress has been made in works of public improvement with very little addition to the public debt. The general prosperity of the country is shown in the extension of trade, agriculture, and other industries. There has been a marked increase in the population, every year adding two or three millions to the tax-payers of British India. There is a gradual reduction of the National Debt and of the interest upon it. Many have suffered from the fall in the rate of exchange, *but the cheapness of silver has something to do with the prosperity that is shown by the Budget statement and has helped the people of India to bear up against their misfortunes. So that if they lose in one way they gain in another. The loss by exchange is recouped by the general prosperity of the people to which the cheapness of silver conduces.* These facts speak volumes for the improvement of the country within this generation, and especially within the last fifteen years, and I think, the House is thoroughly to be congratulated on the existing state of things as shown by the present Budget. It is quite clear that those who are hest ahle to judge have come to the conclusion that the credit of India is good, and that the Government of the country is thoroughly to be relied upon."

I would ask you to compare the foregoing with the remarks made by Sir James Westland a few days ago, on the existing condition of Indian Finances. Not many weeks ago the Government deprived a Rajah of the privileges of his rank for alleged harsh treatment of his ryots. I wonder whether there is any prospect of similar punishment heing accorded to the authors of the 1893 policy. The only sensible remedy to the present unfortunate position of India and of her traders is to gradually re-open the mints to the coinage of silver. As London thinks in gold, let India think in silver. Instead of borrowing or purchasing gold, let rupees be sold in Calcutta, Bombay and Madras hy weekly tender, the tenderer of the greatest weight in silver bullion for each lot, say of one lakh of rupees, becoming the purchaser. The Government could fix a limit from time to time under which rupees would not be sold, therehy establishing an automatic silver currency regulated hy the trade demand for money. This, with the application of the knife to certain of the home charges, would give to India the fullest measure of prosperity.

India's great currency problem can be solved by her fields and hy her looms, and by them alone.

Gentlemen, I must apologise for having taken up so much of your valuable time. My only excuse for having done so is that the interests of your Bank are indissolubly connected with the prosperity of Indian trade in all its branches. I cannot help feeling that the high rates of interest now charged for accommodation are telling very heavily on all the industrial undertakings of the country, leading gradually to their decay and discouraging all effort in the direction of extension.

PLANTING NOTES.

RUBBER-GROWING IN PERAK.—Planters in Ceylon interested in this industry will give attention to the useful Notes affording official experience in Perak up to the end of last year prepared by Mr. L. Wray, curator, and which will be found in our *Tropical Agriculturist.* These notes are specially useful to compare with those given in the Ceylon Botanic Gardens and Forests' Reports and the latest results of all will be given in a second edition of our Manual on "India-Rubber and Gutta Percha" now being prepared.

TEA IN AMERICA.—The following is from the American *Grocer* of Jan. 5th :—

The estimated supply for the United States and Canada, seasons of 1897 and 1898 is 86,200,000 pounds against 93,551,357 pounds season 1896-97. Total shipments, as advised by mail January 1, were 75,298,904; to be shipped, 10,901,096, of which 6,485,561 pounds are Formosa, showing a very backward movement of the crop. From the estimated supply there must be taken the quantity of tea rejected at all ports, estimated at New York alone at fully 5,000,000 pounds for the present season. It is also stated that 1,500,000 pounds of Formosa yet to he shipped will not come up to present standard and is not likely to come forward. The estimated supply of green is 13,000,000 pounds, against 16,216,906 last season; of Japan, 42,500,000 pounds, or 176,418 pounds less than in 1896-97; 17,500,000 pounds Formosa, or a decrease of 1,494,324 pounds; only 200,000 pounds of Amoy, against 1,152,846 pounds last season; 4,000,000 pounds Foochow, an increase of 569,673 pounds; 9,000,000 pounds of Congou, a decrease of 2,080,536 pounds, as compared with the previous season.

The above brokers' statement fails to take account of the movement of Ceylon and India tea, of which 12,000,000 pounds were imported last year into the United States and Canada. Statistically the year opens here and in England much better than last year.

CEYLON TEA IN RUSSIA.

MR. T. N. CHRISTIE'S REPORT.

We have received the following from Mr. A. Philip, Secretary to the Ceylon Planters' Association :—

REPORT ON A VISIT TO RUSSIA IN CONNECTION WITH THE PROSPECTS OF CEYLON TEA THERE.

During my trip to Russia, which occupied four weeks, I visited St. Petersburg, Moscow, Kief and Odessa, and I gathered much information on the subject of my mission both from wholesale and retail dealers, as well as from other sources.

My inquiries were much facilitated, and my trip rendered pleasant, by the efficient services of Mr. C. H. Mackie (Proconsul in the Consul General's Office, St. Petersburg) in the position of Secretary and Interpreter to Her Majesty's Consul-General in St. Petersburg (Mr. J. Michell), Consul in Moscow (Mr. A. T. Medhurst), Consul-General in Odessa (Colonel-Stewart, C.M.G.) and Vice-Consul (Mr. H. G. Mackie) in Odessa, all interested themselves greatly in my enquiries and rendered me much assistance. Colonel Stewart, I may mention, was especially interested in Ceylon, being the son of a former Civilian and having been born in the island. He is likewise an old friend of H.E. the Governor.

The Russian tea market is one on which Ceylon has cast longing eyes for some years past, but it is well at the outset to understand that with one exception—a very important one it is true—there are no facts which make it at all attractive. The one attraction to us is the fact that Russia consumes in the aggregate a large quantity of tea—that there is still a world for us to conquer—but the consumption per head (for a tea drinking country— is miserable, the area of territory over which this consumption is spread is vast, and the conditions under which the trade is carried on are, one and all adverse to an increase of consumption and to a rapid change in the channels of supply.

In explaining these adverse features, it may be well to point out that they are not discouraging opinions of my own, but facts, the clear knowledge and recognition of which may save individual disappointment and the expenditure of public money in directions unsuited to the conditions we have to deal with.

IMPORTATION AND CONSUMPTION OF TEA IN RUSSIA.

The consumption of tea in Russia (excluding Finland) last year (1896 was about 52,000,000 lb of leaf teas and 40,000,000 lb of brick and slab teas, while the population by the census of 28th January, 1897, is shown to be 126,683,000. There was also an importation of green tea, but it is excluded in the official summary of imports, and seems to have been almost entirely re-exported to Asia. Finland, with a population of 2,527,000 imported 179,000 lb, and the import duty there is about 20 per cent. less than in Russia. From the table A. included in my annexures, it will be seen that the importation at the Black Sea frontier has during the last 10 years steadily and largely increased, while that at the Russo-Prussian frontier has proportionately diminished. The meaning of this is that the business in China tea for Russia, at one time to a great extent done in London, is now done by direct shipments from China to Russia in the Volunteer fleet steamer. That the import across the Russo-Prussian frontier has not been killed altogether, and has indeed slightly gone up of late, is due to the increasing importation of Ceylon tea from London via Konigsberg. Although it was natural that there should have been a tendency towards direct shipments between China and the Black Sea, the change in that direction has been much accelerated by the establishment of differential railway rates on goods from Odessa to the Interior. Tea arriving in Russian ships is taken to Moscow for 92 kopecks per pood, while that arriving in English or other foreign ships is charged 1 rouble 20 kopecks per pood. This differential rate happens to act in favor of Ceylon as against India, owing to the fact that the Volunteer boats call at Colombo, but it is none the less unfair and in contravention of the most favored nation clauses of our treaty with Russia—see Articles IV. and V. of that treaty, Annexure E. From the figures given in my Annexure C. it will be seen that the importation at Irkutsk of China tea by the overland route has been well maintained during the last 3 years, and that, including brick tea, some 64 per cent of Russia's total consumption crosses the Chinese frontier, but of the leaf teas, which form our principal interest, less than 38 per cent adheres to that route.

I was surprised to find that in addition to there being, naturally enough, lower scales of duty on brick and slab teas, two rates of duty on leaf tea are in force. Tea crossing the Chinese frontier is charged a duty of, say, 1s 2d per English lb., while tea entering at the European frontier is charged, say, 1s 10½d per English lb. As Britain has no access to the Russo-Chinese frontier, this is practically a differential duty and a breach of our treaty of Commerce--see Article II of that treaty, Annexure E.

When one hears of the time occupied in bringing tea overland, one wonders that any tea for western and southern Russia should continue to come by land. It is generally 8 months on the way, often unheard-of, and its whereabouts unknown for 3 or 4 months, and the wholesale importer has to find the money for its purchase nearly a year in advance of its sale by him. The expense of the land route is about 30 kopecks per pound more than that of the sea route, but the difference in duty is about 33½ kopecks per lb. in favour of the former, and so the trade continues. Much of the tea, I was told, already reaches the new Siberian railway at or east of Tomsk, and the further extension of that Railway will alter many of the conditions of the overland trade. Ceylon tea chiefly enters Russia through the Russo-Prussian frontier, but the supply for St. Petersburg goes direct by the Baltic, except in winter, and the shipments to Odessa both from Ceylon and London supply the southern demand and to a small extent Moscow, etc. It is not possible to find out how much Ceylon tea enters Russia, as the English returns cannot discriminate whether tea shipped to Germany is for consumption there or for transit, and the Russian returns cannot discriminate between Ceylon, Indian or China tea coming through European ports.

I believe the consumption of Ceylon tea was close on four million pounds in 1896, and I would expect, from all I heard, that that quantity was considerably increased in 1897. I found that opinions varied as to the relative advantages of direct as against London shipments, but as yet a large majority of importers prefer the latter, and my opinion is that for the Moscow and Northern

districts, they will remain the most popular. There is such a manifest advantage in being able to receive by post samples of teas about to be exposed at Mincing Lane, in time to wire, or even write, purchasing limits and orders, that the saving in transport does not compensate for the uncertainty of Colombo, bought teas being precisely what is wanted. Direct shipments will, I doubt not, greatly increase, particularly if large uniform lines of tea can be purchased, and Odessa will more and more become the distributing centre for the South and South-East. I believe that through rates from China and Colombo to Moscow have been arranged for, and the system in force of keeping the teas in bond during their journey to and storage at Moscow, enables the dealers to clear just the quantities they may from time to time require. There is, I may mention, no foundation for the statement, made to me in London, that the Russian Customs' regulations necessitated the clearing of, and consequent payment of duty on, the whole of a consignment at once. The dealer can draw as much or as little as he likes, and he pays duty only on the quantity taken out. There are no Octroi duties in Russia.

GOVERNMENT REGULATIONS CONCERNING THE SALE OF TEA.

No tea can be sold retail in Russia except in closed packets and no packets can be sold unless they have been packed in an authorized packing-room in presence of a Government Officer, and have the Government bandarol or wrapper round them. Indeed, although the tea has all previously paid the import duty it is treated in the merchants' warehouses precisely as if it were in bond until the packing is finished and the bandarol affixed. The Government supplies and pays the supervising Officer, who keeps the keys of the warehouses, and it is only in his presence that the teas are moved to the packing-room, bulked, weighed and packed. He keeps detailed records of all the quantities received and sent out, and returns are rendered to the central authority. The Officer has it in his power to be obstructive, but I fancy a private monthly payment secures his good-will and makes him act as a general superintendent of the packing-room and the workers employed there. At present the Government requires that a minimum quantity of 48,000 lb. per annum shall be packed before they will grant authority for a packing-room to be established. It was reported that this minimum is about to be raised to 200,000 lb. per annum, but I could get no official confirmation of the report. The Government makes a charge for the bandarol label varying according to the size of the package. On a one pound (Russian) packet it is ¼ kopeck, on a half pound 1-5th, on a quarter ⅙, on an eighth ⅛, and so on.

This system of compulsory Government supervision and use of a bandarol is of recent origin, and was introduced with the ostensible, and, no doubt, to some extent real, object of preventing fraud in weight and adulteration, but the large firm of Russian dealers to whose influence the system is said to be due, undoubtedly hoped that it would crush out all their small rivals.

It does offer a serious obstacle to the starting of a small business, and it entirely prevents the importation of packet teas, but small dealers have in some instances combined and maintain one packing-room amongst several, and in other cases they send their teas to be packed at one of the establishments, paying an arranged-on charge. I heard this charge in St. Petersburg quoted at 4 kopecks for 1 lb packets.

THE CUSTOMS OF THE RUSSIAN TEA TRADE.

One of the prejudices on the part of the consumer adverse to small dealers is that of dealing only with shops which sell nothing but tea, or, at most, tea and the kindred products—coffee, cacao and sugar. The rent, taxes and administrative charges all fall on the one article, and it requires a large turn-over to meet them. In the country and in the poorest portions of the City, the prejudice does not hold good, and shops with a general business sell packet teas, supplied by some of the large packing houses. *The* custom of the Russian tea trade which is most adverse to small wholesale dealers is that of giving long credit.

The scarcity of money in the country, the long time occupied in transporting goods to the outlying districts, the necessity in some places, where winter closes the transport, of laying in stocks months in advance and probably the rivalry between the few large wholesale dealers, has led to a system of very long credit having become quite inseparable from a wholesale business. Six months is the usual period quoted, but it is often extended, and nine and even twelve months are not unheard of, It will be easily seen what a large capital is necessary to enable the wholesale merchant to provide for these long periods the cost of the tea and, what is much more serious, the 1/10½d per lb of duty. The wholesale dealer gives the retailer a high discount—20 per cent. I believe is usual and as that discount is not merely on the cost of the tea and its packing, but also on the duty, it is evident that the price of the packets must be fixed at a very high figure in order to cover the discount. The Russian peasant is extremely poor, and the minute size of the packets prepared for him shows the limit of his purchasing power. Packets containing half an ounce are largely dealt in, and I saw some which contained but one-seventh of an ounce. I was assured that there are millions of the people to whom tea and sugar are practically unknown.

THE DUTY ON TEA IN RUSSIA.

The crushing import duty to which our teas are subjected, and which, as I have said equals 1s 10½d per English pound, is of course the greatest hindrance to extended consumption. The present rate of duty on the European frontier seems to have been fixed in 1885, being a slight reduction on the previous rate, and that on the Siberian frontier in 1887, when it was slightly raised.

The price of tea has, as we know, fallen considerably during the last ten years and the *ad volorem* incidence of the duty has become much heavier. The Russian duty must now equal on an average more than 300 per cent. on the value of the article, for much of the China tea imported costs less than 6d per lb. The duty is, of course, in no way a matter of treaty arrangement, and can be altered at will by the Russian Government. Its reduction would greatly stimulate consumption and benefit the poorer classes.

ADVERTISING IN RUSSIA.

I found that while all the retail dealers in Ceylon tea were anxious that advertising should be undertaken and looked to much benefit therefrom, the whole sale merchants expressed the opinion that it would be of no use. The con-

ditions met with in Russia certainly differ widely from those in the countries where so much money has been spent on advertisements of our staple. The great mass of the people cannot read, and to this fact is attributable the rather curious extent to which picture representations of the goods dealt in are displayed on the outside of shops. The newspapers are read by comparatively few, and the journals have even a more limited circulation. The censor, too, has to be reckoned with, and no advertisement either in newspapers or by means of circulars, brochures or placards is allowed until the matter has passed him. There are a good many restrictions as to what may be said, and I was told by a leading advertising agent that such statements as "Ceylon tea is the best" or "Ceylon tea is preferable to China" would certainly be struck out. I asked whether in a brochure one might mention the fact of the Czar having accepted a gift of Ceylon tea, and I was told that such a statement would not be allowed, and that the names of members of the Royal Family could not be mentioned in connection with any commercial matter. Mr. Rogivue informed me that as regarded some suggested advertisements by means of magic lantern slides and descriptive lectures, it would be necessary to have the pictures approved of and a licence or permission for each lecture obtained, and that the presence of a Government Officer on each occasion would be essential.

Apart from the difficulties attending advertising in Russia, it must be remembered that nine-tenths of the Ceylon tea which goes into consumption in that country does so mixed with China tea, unacknowledged by the dealer and unknown to the consumer. The continued and extended use of Ceylon tea must for several years to come be as a strength and colour-giving ingredient in the dealers' mixtures. It is plain that for that description of business advertisements would not be of use. I enclose a *pro forma* estimate for a general and extensive advertisement of Ceylon tea drawn up for me by a leading Moscow Agent. The cost, it will be seen, is considerable, say, £4,800 foi £3,200 insertions amongst 80 of the leading papers and journals. The advantages of dealing with an Agent are that a larger discount is obtainable, and payment can be made at the end of each month, *after* the advertisements have appeared.

THE ATTITUDE OF THE RUSSIAN DEALERS TOWARDS CEYLON TEA AND THEIR USE OF IT.

Speaking generally, the attitude of all the large Russian dealers is not a friendly or appreciative one. They are conservative in their trade, and they regard a new product as likely to bring in new dealers and possibly unsettle their Agents and customers. They would, I think, prefer that Ceylon had not appeared upon the scene, and most of them have, as it were, been driven in self-defence to handle a product that a few years ago they would not have touched, and which they declared was unsuited to the Russian taste and mode of drinking tea. The chief reason given me for the proportion of Ceylon tea now used by almost every packer was that the quality of China tea had fallen off and that Ceylon tea had to be used to give strength and colour to the mixture. The great cry, however, seemed to be for cheapness, and the lowest priced China leaf supplies the quantity, while a Ceylon tea gives the strength. I found the importers quite alive to the advantage which the lower exchange gives to China tea, and I heard the opinion expressed that the consumption of Ceylon tea would not increase, and might, indeed, decrease owing to the lower sterling cost of suitable China tea.

MR. ROGIVUE.

I visited all of Mr. Rogivue's establishments in Moscow, as well as that of his Agent in Kief, and I inspected the shop which he has secured, and is about to open, in a capital position in Odessa. I am able now to form some idea of the great difficulties he had to face and overcome, and the Thirty Committee has never in my opinion spent any money to greater advantage than that spent through Mr. Rogivue, who might well claim much of the credit for the present satisfactory consumption of Ceylon tea in Russia.

RUSSIAN TEA IN THE CAUCASUS.

From all I heard of the cultivation there, I do not think Ceylon has much to be afraid of. Of course the cultivation could not be carried on at all but for the heavy protection afforded by the import duty, and the general opinion seemed to be that with the chance of the Government puting on an excise duty (if the production ever became seriously large] and the difficulty of getting labour, it was unlikely that much land would be opened out. The sample of tea I saw was of very fair quality, and I believe most of the tea is sold in Kief.

SUMMARY AND SUGGESTIONS.

Every fact I learned and almost every opinion I heard leads me to the conclusion that while Ceylon tea has got a firm hold in Russia and will more and more go into consumption there, the market is not one to be carried by assault, and we must be content to see and stimulate a steady annual increase. When we consider the opposition and the various retarding influences, nothing could be more encouraging than the almost ten-fold increase which has taken place in the last half dozen years. The mixture of Ceylon tea with China will gradually accustom the Russian taste to a stronger and more flavory beverage, and eventually pure Ceylon tea will be appreciated and asked for, but for a good many years to come, I think the great bulk of our tea taken by Russia must be consumed mixed with that of China. It is not much matter to us how it is consumed so long as it *is* consumed; only were the taste more for our tea in its pure state we could push its sale much more efficiently than we can, so long as its use is for mixing. My recommendations to the Committee may start with a negative one, viz, not to think of appointing a special Commissioner to push the business, as has been done in America. Such a Commissioner would find little to do. He could only come to the conclusion that retail dealers were the people to aim at aiding, and he would find, even with Mr. Rogivue's success as a beacon to attract them, but few people prepared to devote the necessary time and capital to the enterprise. He would find that the wholesale dealers would regard him as a positive enemy to be checkmated in every possible way. The conditions which now prevail will gradually change, and after some years there may be scope for a Commissioner, but at present there certainly is not. I recommend for the present the Committee should

1. Endeavour to get the Russian Import duty reduced, as the greatest aid to increased consumption.

2. Encourage retail dealers in much the same way as they have done Mr. Rogivue.

3. Advertise the merits of Ceylon tea.

The first of these recommendations will be considered a big order, but there is nothing which would aid us more than a reduction of duty and consequent increase of consumption. A very strong case can be made out for a reduction, and as Mr. Chamberlain has expressed his great desire to aid Colonial trade in every possible manner, we could rely on all his influence being used in favour of the request. The request may not be successful at first, but the matter should be constantly kept in the foreground and would eventually have a successful issue.

Having stated that a Commissioner would find it difficult to find retailers prepared to devote themselves to Ceylon tea, my second recommendation may seem rather a contradiction, but there is a difference between the number of retailers required to justify the expense of a Commissioner to supervise them, and the number which the Committee would get into correspondence with, and one result of my third recommendation, if it be given effect to, would be that of increasing the number of retail dealers. My own observation, apart from Mr. Rogivue's demonstration, leads me to think that the retail of Ceylon tea in Russia offers a good opening for anyone who, having the proper qualifications, devoted himself to it and had sufficient capital to tide over the first or two.

In making my third recommendation, I do not advise advertising to the extent contemplated in the *pro forma* estimate which I enclose. At first the newspapers advertising should be limited to some selected papers circulating in the towns where pure Ceylon tea is sold, and there would be no difficulty in arranging a contract for that, and, what is more important arranging for the regular verification of the appearance of the agreed-on advertisements. Such advertisements should be general and name no particular dealer, but the dealers in pure Ceylon tea should be informed of the advertising programme, and thus placed in a position to issue their own supplementary advertisements with advantage. As I will shortly have an opportunity of discussing the matter personally with your Committee, I refrain from entering into further details in connection with my suggestions. I found it difficult to obtain in London reliable information on many minor points connected with Russian business. I, therefore, annex a brief memorandum which may be of use to those contemplating business there. THOS. NORTH CHRISTIE.

3rd January, 1898.

TEA GROWING IN THE RUSSIAN CAUCASUS.

To the main report by Mr. T. N. Christie on the prospects of Ceylon tea in Russia there are annexures: one of them is an interesting estimate of tea crops in the Caucasus:—

Extract from Russian Newspaper.

The following quantity of tea may be expected to be grown in the Bautoum district during the following years:—

PLANTATIONS.

	Popoff.	Solovtseff.	Russian Govt.
	lb.	lb.	lb.
1897 ..	720	180	—
1898 ..	5,040	360	—
1899 ..	12,600	9,000	—
1900 ..	18,900	34,200	5,580
1901 ..	64,800	50,400	22,140
1902 ..	86,400	61,900	52,920

Total expected in 1902—200,526 lb. Eng.

I think the quantities for 1897 must be considerably more than this. I know Colone Solovtzoff made more in 1896, and he has a "Little Giant" Roller.

(Initialled) T. N. C.

STENNING, INSKIPP & CO.'S CEYLON, &C., TEA MARKET REVIEW FOR 1897.

INDIAN.—POSITION AND PROSPECTS.—The new year commences with a Stock of 61,673,000 lb., as comparod with 54,145,000 lb. a year ago; these latter figures, however, do not include an amount of 2,000,000 lb. that had then arrived but had not been taken into Stock, whereas the total for 1897 includes all arrivals. The Delivery for the year is disappointing, showing an increase of only 2,676,000 lb during a time when taking the quality into account the average price of 9d has offered extremely good value; hence the statistical position can hardly be regarded as satisfactory, and in view of the ever increasing supply there is some ground for apprehension concerning the future of prices for teas of poor quality. Consumption at home having now reached a high figure, further expansion in this direction can only be looked for on a gradual and small scale, and it would seem therefore that the main outlet for the increased production of coming seasons will have to be found in outside markets. In these circumstances it is encouraging to find so large a quantity of Indian growth already being taken for Australia, New Zealand, Bombay and Canada; but in the United States, where it was hoped ere this a large market for our teas might be found, progress has been but slow, and this is the more disappointing when the money, time, and labour given for some time past are considered.

JAVA.—38,905 packages have been brought to auction, against 39,666 packages in 1896. The quality of the Imports generally is still satisfactory, the liquors being fairly strong, and the leaf very well made.

CHINA TEA.—In our Annual Review of 1896 we alluded to machine-made teas from China. During the present season several parcels have arrived from Foochow, which consisted principally of very small lots; the leaf generally was fairly well made, but the colour of the infused leaf was too dark, and the teas had been too highly fired. They met with a poor reception, and sold at prices which are stated to be unsatisfactory to the Importers. Hardly any of this New Method Tea has been received from the North of China.

CEYLON.—THE COURSE OF THE MARKET.—The dulness that marked the closing auctions of 1896 continued into the early part of January, when a better demand took place, which was maintained throughout February, and in March whole leaf tea fractionally advanced, whilst fine kinds declined; no alteration took place in April, but in May a good enquiry sprang up, common kinds hardened, and fine sold at firmer prices, due to increasing scarcity. Owing to poor quality, in June all teas but a few finest gave way. The low range for common and medium teas attracted competition in July, but without influencing quotations, whilst fine tended upwards. Very large auctions took place in August, and as the quality showed some improvement, the competition was good at firm prices for desirable teas; this position was maintained until the middle of September, when smaller totals of better quality led to a brisk enquiry at full rates, and in the case of fine invoices to an advance, which was kept up during October; the commoner grades being in less supply, went a little dearer. Although in November totals at auction were small, there was less activity, and all teas went in favour of buyers. The enquiry continued slow throughout December, except for a few useful invoices which were well competed for at the closing auctions.

SMALL BREAKS.—As we have previously notified, lots of less than 18 chests, 24 half-chests, or 40 boxes, are reckoned as "small breaks;" occasionally dnring the year the proportion of these in the auctions has been excessive, and we would here repeat the remarks in our Circular, 4th March, "it would greatly facilitate business in every way if larger breaks, particnlarly of the lower descriptions, could be sent forward, and it seems to us that this might be managed in the case of many gardens by sorting for fewer grades." With the increasing, totals coming to auction it is to the producers' interest to avoid small breaks, as mauy buyers have no time to examine them, and confine their attention to the larger parcels.

QUALITY.—The proportion of finest invoices has been somewhat small, but there has been a fair selection of useful parcels; common descriptions were plentiful, and often of very poor character, especially so in the case of Colombo purchased teas, for which the offers made here were exceedingly low.

LOSS IN WEIGHT.—As this occasionally gives rise to much dissatisfaction we offer the following suggestions: tbat the gross weight of the package should be a few ounces, say four or five, *above* an even number of pounds, and that the empty, package, complete with lead, nails, bands, &c., be to a like extent *below* an even number of pounds. In weighing here the gross weight is *reduced* to the even nnmber of pounds, whilst the tare is *increased* to an even number of pounds. With regard to garden bulked teas, it is imperatively necessary to put an equal quantity into each package of the break, and this quantity should be four or five ounces over the desired weight of content, viz., if the packages are invoiced to contain 100 lb. tea each, not less than 100 lb. 4 oz. should be weighed in; test packages, weighing here a fraction under 100 lb., are reckoned as 99 lb. only, or a loss of 1 lb. on each chest of the break.

Carefnl observance of the foregoing precautions will prevent loss and disappointment.

DRAFT of 1 lb. per package on all packages grossing 29 lb. and upwardss is allowed to the buyer.

WEIGHT OF PACKAGES.—When a gross weight of 129 lb. is exceeded, there is an additional charge of 5d per package up to 159 lb. The following scale of charges fully explains tbis and deserves attention:—

Dock and Warehouse management rates, snbject to an uniform discount of 10 per cent, on packages grossing as under are:—

160 to 199 lb.	130 to 159 lb.	90 to 129 lb.	80 to 89 lb.
2/9	2/3	1/10	1/8
60 to 79 lb.	45 to 59 lb.	35 to 44 lb.	17 to 34 lb.
1/5	1/2	1/-	-/7

MARKS ON CHEST.—Nothing is wanted or is of any service here beyond (1st.), Garden Mark; (2nd.), Description of Tea; (3rd.), Garden Numbers. Gross, tare, and net, are not of the least use, and should be discontinued.

METAL PACKAGES.—There is practically no objection to these now, except on the part of some Continental buyers.

PACKING SMALL BROKENS AND DUSTS.—Special care should be taken to pack broken descriptions which are so liable to lose in weight, in strongly made wooden packages. Dusts should be packed in half chests, either of metal or of strong iron-hooped wooden packages; canvas coverings should in no case be used, as they disguise injury done to the packages by rough handling, and any tea retained in the canvas becomes of no value.

NOTES ON BALANGODA-BAMBARABOTUWA.

A NEW CEYLON TEA DISTRICT.

John Dent Young's cart road trace—some eleven miles of which are being cut to Vevelkettiya—is nowhere steeper than 1 in 35 and goes in at Meriakotta and I think is 32 miles from Ratnapura. From Vevelkettiya a branch will be cut to Vevelwatte where the huge Hopewell Company's Factory to turn out 1,250,000 lb. of tea, is being made. Hopewell, Bamberellakanda, Alupola, Wewelwatte, Ballacotum and perhaps later Agar's Land and Welewalamukelana teas may be made here. All the machinery is to be worked by electricity and Mr. Pottie is the engineer.

After seventeen miles of road to Hapugastenne is cut, surely, Government won't stick at the other fifteen required to connect Maskeliya with Ratnapura, which was long ago advocated, but as Mr. Wace, in his Report of Sabaragamuwa, then said there was no trade and no justification to cut this road. No one will say so now witb the thousands of acres opening and busy life and trade going on as far as Hapugastenne, 17 miles up and 4 miles farther, when Kondurugala is opened this year. This road will be a safe outlet for Maskeliya with a Railway slip on. This trace of Johu Dent Young's is ridable now from Ratnapnra to Hapugastenne, and from there on to Hopewell and other estates, and on to Balangoda; the section from Hapugastenne to Rasagalla being made ridable by Mr. James Gray. The branch off at Kondurugalla is about twelve miles, and tbis portion of the trace is overgrown and very wild, and passes just by Kondurugalla Estate (coffee in 1848) bungalow; this is being cleared and cut into bridle-road now.

The Ratganga, one of the principal branches of the Kaluganga flowing past Hapugastenne Estate, the Walawaganga flowing through Wallaboda and Walawadowa past the Balangoda Hospital, and the Kelaniganga going through Gartmore, all take their rise from the true source, viz., a place called Diatalawa or Dictalawa on the top of the Maskeliya ridge. Tbis is a hollow natural dam or swamp full of diaparra trees, swampy marsh and wallowing elephants. This is the true reservoir and natural source of Ceylon's three rivers. It was a foolish idea to think the Walawaganga rose in Walawadowa block, any one, the least bit acquainted with the country could see such a large stream did not rise only in 1,000 acres of forest but far beyond it. It is true it runs througb the middle of it; but its real source is from Diatalawa, and there are numerous other small streams join in from the whole of Maskeliya range, composed of thousands of acres to say nothing of the streams from Detenagalla, &c., and from Bogawantalawa-Fetteresso. The Bilhuloya joins the Walawaganga and all the water of the Horton Plains about Denegama, &c., aud then to say that 1,000 acres was the source of this fine river and to fell that would dry up the Walawaganga was a very far-fetched notion. Diatalawa (which means "water flat"), where the actual and real source of the Walawaganga commences, is also the source of Kaluganga, and Kelani gange, as streams running out of Diatalawa a hollow flat marshy reservoir situated on the ridge of Maskeliya range. This is the source of three of Ceylon's principal rivers, aud in Ceylon geography it says, they take their rise from or near Adam's Peak! Constant streams of coolies and artisans in search of work from Maskeliya, and other places use the road now, where once all was jungle and elephants reigned supreme.

I should say the big firm or Company have opened nothing under 3,000 acres of clearings last year in this District aud that they own quite 10,000 acres land.

The cart road starts from the burial ground, or turn off at outer circular at Ratnapura, crosses by ferry at Malwola where the Bamberabotua and Kuruwitte or Gillemalle River joiu and make the Kaluganga, and a few miles lower down, it becomes navigable for boats. The road goes to Vevalkettiya Estate, and where old John Dent Young in the days gone by (1848) had a rice store for the Hapugastenne and Kondurugalla Coffee Estates. From here the branch road is to go on to Wewalwatte. The rideable road from Hopewell to Hapugastenne is opened, and now shown in Surveyor Generals maps and plans of the district as connecting Balangode with that part of the country and an

outlet from there to Bogawantalawa via Agar's Land is made into a ridable road, and Mr. Horsfall's horse was the first to pass over it. Mahawale estate is closest to Ratnapura, and is owned by the Mahawale Tea Co., Ltd.,—when completed it will be over 600 acres. The cart road goes through the estate, but I expect it will be over a year before the section from Malwala to Ratnapura (or vice versa) will get finished (5 miles) for cart traffic and from there to Wewalwatte is another 11 or 12 miles, but the difficulties are so great that it will take years to make, and may even have to be abandoned in monsoon months before completion. The Company have leased the old stones used in coffee days by the Commercial and Uva Coffee Companies. These will present a lively appearance and busy all over when tea, rice, tea seed and machinery and factory fittings come pouring in, but at present are being used on a small scale.—H. J.

NORTHERN DISTRICTS PLANTERS' ASSOCIATION, CEYLON.

THE ANNUAL REPORT.

After the signing of the minutes of last meeting the Hon. Secretary) read the following report of the past years's work :—

During the year two general and four Committee meetings have been held in Kandy. The change of venue has not been quite so successful in securing a larger attendance of members as could have been wished, though the improved train service is now as convenient, as could well be arranged.

The roll of members is slightly below last year's muster, 88, being then reported as having paid subscription against 85, this year, but several votes have been lost through groups of estates being incorporated into Companies, which register only one vote for the whole group. Your aid is unvoked to try and get in new members in the current year. Balance at credit Association is R79·03 against which is due to Mr. E. E. Green R75 for his book on Coccidœ of Ceylon.

Tea crop estimates have been collected with considerable care with results that may be regarded as satisfactory, no less than 6,734 acres being reported as not yet in bearing, not including considerable acres being opened by native cultivators. Efforts were made to get in some of these figures, but letters to proprietor or superintendent were returned through dead letter office as "not called for." The only effective way in future will be to try and get figures from the larger factories buying leaf.

Figures collected to date are as follows :

40,294 acres planted 33,560 in bearing 14,652,650 lb. tea. To these must be added :—

2,492 acres planted and 2,371 in bearing, no returns received, estimated to yield .. 1,184,800

Total	.. 15,873,450
Against last year	.. 14,114,891
Showing increase of	.. 1,732,559 lb.

	Acres. Planted.	In Bearing.	Estate Yield.	Average.
Allagalla ..	2,366	1,903	1,042,500	547
Kegalla ..	1,860	1,337	670,000	501
Knuckles ..	4,261	3,957	1,705,500	431
Kelebokka ..	4,712	4,455	1,723,000	386
Hunasgeria and Elkadua ..	3,030	2,981	1,147,000	384
Wattegama and Dumbara ..	2,805	1,931	841,500	486
Matale N. & W.	4,957	3,298	1,130,500	555
Matale E. ..	7,746	6,300	2,877,650	456
Rangala and Madamahanuwara ..	5,889	5,194	1,711,400	329
Nilambe ..	—	—	1,136,100	
Hantane ..	5,512	4,575	2,288,400	500
	42,786	35,931	15,837,450	
			17,000,550	

Average per acre 440 lb.

Hantane and Nilambe are bracketed together in order that the figures may agree with those arrived at by the sub-Committee appointed to deal with the official estimate of the tea crop. The Secretary has not the acreages of the Nilambe District either planted or in bearing, but has added the figures giving as approximately the yield of the Nilambe District, excluding estates which were included in Hantane.

Railway Time Table.—The efforts of the Association to get an improved service on Matale-Kandy line may be regarded as satisfactory as regards the travelling public, though complaints are made against the mail service since night mail was taken off.

The new time table practically received unanimous support from members present at various meetings and deputation and the thanks of the Association are due to His Excellency the Governor and to the General Manager, C. G. R. for the concession of afternoon trains. The thanks of the Association are also due to the General Manager and staff for their efforts to meet the convenience of travellers and consignees of goods during the serious interruption of traffic caused by the big slip on the Allagalla incline.

Ukuwela.—Efforts are being made to try and get a siding here for loading and unloading goods, a want which is very much felt.

Hill Tramways.—Although Teldeniya returns showed that a steam tramway would at once give good returns, nothing more has been heard of the results of meetings, &c., in the Rangala District and of reports sent in to the commission.

Post Office.—It is to be regretted that equal energy was not displayed by this Government Department. Bitter complaints have been very general of the irregularity and infrequency of mails throughout the district caused by non-use of goods trains and extra runners during the block on the Railway incline.

The Ukuwela office still remains only a receiving office in the hands of the Station Master, C. G. R, much to the inconvenience of residents in the district. The efforts to secure a proper Post office this year being unsuccessful owing to the "several more urgent cases where Government is unable to sanction for the present the necessary funds."

Labour.—Generally the districts have been better supplied this year, large numbers of coolies having come in from the coast. The proposed labour federation is in the hands of Parent Association and matters may be left to your committee. A sub-committee has drawn up a set of rules, which has been adopted by General Committee to be brought before next annual general meeting. Your committee commend the Federation to the hearty support of proprietors and Superintendents in the district.

Benevolent Fund.—This is deserving of more general support and the Committee urges on members its claims and would refer them to the last annual report recently circulated for evidence of its usefulness.

Mines & Machinery Ordinance.—Rules in connection with this new ordinance have been sent by Government for circulation among members and copies were recently posted out.

Ferguson Memorial Hall.—The foundation stone was laid by Her Excellency Lady Ridgeway in Kandy on Tuesday 29th June, 1897, and the contractors are now busy at the foundation trenches. So we may hope ere long to see the walls rising.

Indian Famine Fund.—Your Association made special efforts to secure support and nearly R1,400 were collected and sent in to Mr. Philip.

Consulting Entomologist.—His Excellency deserves the thanks of planters for allowing a small grant to Mr. Ernest Green, Hony. Consulting Entomologist, for conducting experiments. Mr. Green has drawn up a scale of fees and his services are at the disposal of members on very reasonable terms.

Cacao Disease.—Mr. Willis, the new director of Botanic Garden, Peradeniya, has been very energetic in publishing three numbers of a circular on this subject, all of which have been reported in the local papers, and copies have been sent to most of your members through the courtesy of the Director, Royal Botanic Garden.

His Excellency the Governor thought the matter of sufficient importance to make special allusion to it in his address to the Legislative Council on November 5th, 1897. His efforts to secure a Cryptogamist from Kew were unsuccessful largely through the adverse report of Mr. Thiselton Dyer, but private enterprise has stepped in and a sub-committee has been appointed by Parent Committee in Kandy to communicate with Mr. Dickenson with a view to steps having taken to carry out arrangements connected with the Cryptogamist's investigation.

Licensing Boutique-keepers.—The Dimbula resolution on this subject received the unanimous support of the Association. It is on the same lines as N. D. P. A. registration scheme which is familiar to you all.

The thanks to the Association are due to the Parent Association for their courtesy in allowing us the use of their rooms for our meetings.

Obituary.—We have to regret the loss of your late Secretary, Robert N. Anley and of Mr. Penny and Mr. G. W. Rudd. Owing to the lamented death of your late Secretary a new one had to be appointed and Mr. Chas. Gibbon undertook the office again in April last, to whom thanks are due for the interest, energy he has shown.

CEYLON TEA IN RUSSIA.

Appended to Mr. T. N. Christie's Report, which we publish on another page, are several tabular statements. One shows the import of tea at the European frontiers of the Russian empire during the period 1887-1896, the total in the last named year being 887,000 lb. against 591 lb. in first. In the next table there is shown the quantity of tea imported into the whole of the Russian empire during 1896, the total of green tea of high quality being 113,998 lb., of green tea of low quality 14,739 lb., of block tea 1,444,154 lb., of brick tea 987,817 lb., and of slab tea 45,422 lb. From these quantities after inspection were forwarded for clearance, (1) to the Askhtbad Custom House 28,554 lb., to the Bokhara Custom Honse 42,676 lb., and (2) to the Bokhara Custom House 12,062 lb. Another table is given in which is indicated the quantity of tea on which duty was paid, as also its value on importation into Russia during 1894-1896. Following that there is a translation of section 20 of the Russian Customs tariff and the following :—

RATES OF DUTY ON TEAS.

European frontiers Roubles 21., gold, per Poud or £10 10s 8d. per cwt.-1s 10½d. per lb. English.

Siberian Roubles 13., gold, per Poud or £6. 3d. 4d. per cwt. 1s 2d. per lb. English.

There is also appended a copy of the principal articles of the treaty of commerce and navigation between Her Majesty and the Emperor of all the Russias.

RUBBER CULTIVATION IN CEYLON.

The fourth circular issued by Mr. Willis, Director of Botanic Gardens, affords a very good and useful summary of information on the subject of "Rubber," although, so far as we can see, there is nothing specially new, and a good deal of the practical information is taken from the Reports of the Forest Department. Mr. Willis tells us that the world's consumption of rubber is now over 100 million lb. per annum worth more than 10 million sterling and nearly half of this comes from Para. We shall be compiling full statistics shortly for our Handbook and will be ably to verify these estimates. The discovery of the new rubber-yielding tree *Kickxia africana* has met the increasing demand and kept prices down ; but the reckless destruction of trees in collecting must erelong tell. Mr. Willis proceeds to give an account of the Para district, the estimate and soil suited for *Hevea* (the Brazil rubber), the mode of planting, rate of growth, the mode and yield in tapping. He shows that tappings at weekly intervals of trees about 2 ft. mean girth in 1897 gave a return of 5·17 oz. per tree. Heneratgoda experiments point to 90 lb. rubber per acre after 20 years—not very encouraging ; but Mr. Willis thinks better results can be got by planting closer and tapping earlier. As to cost of opening plantations, he takes R75 per acre for cost of 300 acres of land and shows a total outlay of R75,777 up to the 10th year or with interest at 7 per cent. R110,000 equal to R366·66 per acre. Taking the yield in the 10th year of this properly planted plantation at 100 lb per acre we get a gross return of £10 or R150 per acre, and taking R50 for cost of harvesting, carriage to London, &c., we get R100 an acre, or 27 per cent. on outlay leaving an ample margin for contingencies and satisfactory profit. The circular will be found on another page.

NOTES ON RUBBER GROWING IN PERAK.

MEMORANDUM BY MR. L. WRAY, CURATOR AND STATE GEOLOGIST, PERAK.

The first seed of the Para rubber (*Hevea brasiliensis*) was introduced into Perak in the year 1882 by Sir Hugh Low, the then British Resident. It was sent to me to plant, but did not germinate, having been kept too long after picking. A second lot was received a short time after and was planted at Kuala Kangsar ; so that the larger trees there are now about 14 years old. In 1887 some seed was obtained from the Kuala Kangsar trees and planted in the Museum grounds, Taiping. The soil is very bad, the land having all been mined over, but still the trees have grown well and have attained, in the ten years which have elapsed since they were planted, a considerable size. Finding that they grew so well I ventured, in 1891, to write to Sir F. A. Swettenham, the then British Resident of Perak, suggesting that they should be planted on waste lands, and, as a result, Mr. O. Marks, then Superintendent, Government Plantations, put out a number of trees at Kuala Kangsar, which are now about six years old and are doing very well.

It may be stated that it will thrive in any locality, from the *bakau* swamps to the foot-hills, and on any soil, from rich alluvial to old mine heaps.

There is little to guide one on the subject, but from 15 to 20 feet apart would appear to be about the correct spacing. At 20 feet it might be necessary to plant something in between to keep them from early branching, but this would not be necessary at 15 feet. In Larut, at an estate at Kampong Dew, they are being planted at 10 by 10 feet, that is 544 per acre. It is very close, but it is the intention, I am informed by Mr. Waddell Boyd, the manager, to thin them out later on to 20 by 20 feet or 108 per acre, tapping the intermediate trees—that is, those which are ultimately to be thinned out—as early as possible and as severely as they will stand, while the others are allowed to grow to a large size before tapping.

With a view to giving some data respecting the growth of the trees, I have measured some of those in the Museum grounds. These trees, it is to be remembered, are 10 years old and are planted on mined land of the poorest quality.

For 13 trees the mean height is 74 feet and the mean girth at 3 feet from the ground is 4 feet 2 inches. This gives a mean annual growth in height of 7 feet 3 inches, in circumference of 5 inches and in diameter of 1·6 inch. The greatest difficulty in planting Para is the very short time which the seed remains good after it falls from the trees. The time which

elapses before they are planted should not under any circumstances be longer than a week, and if they can be planted before this so much the better. Sown at once nearly all germinate, but each day which intervenes increases the number of failures till, at the expiration of ten days or so, none grow, The trees are very prolific seed bearers. Those in the Museum grounds have this year yield nearly 14,000 seed—or, to speak more correctly, that number have been collected. At 15 by 15 feet, 14,000 seed would be enough to plant 72½ acres of land. Where the land is ready it is certainly an advantage to plant the seed at stake, but where this cannot be done not much loss would follow planting in nurseries and then transplanting. The thing to avoid in this method is the production of double stems near the ground, caused by the original shoot dying out or being broken off. In the first few years a littlo judicious pruning would prevent this tendency to throw up more than one stem. In other respects they do not require any pruning, nor after the first few years any attention at all except a little cleaning with a parang. The trees are vigorous growing and, have such thick foliage that they would soon cover the ground and effctually keep out all weeds and scrub. Many methods have been suggested and tried for tapping the trees, but what may be called the herring-bone method appears to have advantages over the others. This is the way the Ipoh trees are tapped by the wild tribes of Perak and it is also used by the Malayas for tapping trees yielding bird lime etc. The American rubber collectors also adopt the same method for tapping Castilloa. In 1888-9 the trees, Para and Castillea, at Kuala Kangsar were tapped by herring-bone cuts by Malays.

On 5th July, a rubber tree in the Museum grounds was tapped by a herring-bone incision in the bark of the trunk about ¼ inch wide and reaching down to the wood. The cuts were widened several times to ultimately about ½ an inch. By the 7th October, the cuts were closed up with a new growth of bark. Three months is therefore sufficient for the covering over of ½ inch wide cuts made right down to the wood. The last places to heal over were those where the side cuts met the vertical one. Here, of course, the width of exposed wood was considerably more than half an inch. The best way of carrying out the herring-bone method of tapping is a matter of much importance, as on it depends the cost of the collection of the rubber. Common knives, chisels, chopping knives, purning knives, etc., are quite unsuited to the work, so I devised an implement for scoring the bark which apparently answers the purpose in a satisfactory manner. The handles are made like a boat-builder's draw knife, but the cutting blade is shaped like the letter U and fixed by a suitable set screw or wedge in the bar joining the handles and in the same line with them. In cutting a herring-bone incision the knife is taken in both hands by the handles and a long vertical cut made in the bark, but not so deep as to reach the sap layer. The blade ploughs out a furrow having the same section as itself and of a depth corresponding to the inclination at which the instrument is held in relation to the surface of the bark; the set of the handles giving complete control over the direction of the blade. The side cuts may then be made to the same depth. Having gone so far and having cleaned away all the loose cuttings of outler bark, the receptacle for catching the sap may be fixed at the lower end of the vertical score, and then beginning from the top of the cut it may by a second application of the tool be deepened to the proper extent. By following this procedure waste of rubber may be avoided to a large extent and a cleaner product obtained. The same instrument can of course be used to enlarge the scores for the subsequent tappings. The scoring knife will, I think, be found to quite halve the time in tapping the trees and do the work in a much better fashion as well. The receptacles for catching the sap can conveniently be made as follows. A tin can is fitted with a sort of sharp straight-edged lip at one side and a hinged lid to keep out fragments of bark, rain water, etc., and it is best and quickest hung on to the treo by a couple of attached wires furnished with sharpened hook points. In this way there is nothing required by the collector but his scoring knife and tins. He wants neither nails, hammers, wet clay, knives, chisels or the other things now in use. Mr. J. C. Willis, Director of the Royal Botanical Gardens, is trying a method of tapping; with small detached V-shaped incisions, made with two cuts of a chisel having a wide blade of about an inch in breadth. These cuts I find heal up in a very short time and do little damage to the tree, but it is doubtful if they will yield as much rubber as the native herring-bone shaped cuts. Mr. Willis informs me his experiments are not yet complete.

Some years back an instrument for tapping was recommended of the following description. A piece of wook about an inch broad and a foot or more long had the central portion set with sharp steel spikes like the hair of a brush. It was to be taken in both hands by the ends, which served as handles, and the spikes pressed into the bark, producing a series of punctures through to the wood. On trial in Perak, on the Kuala Kangsar trees, it was found that although the sap flowed when it was applied in fair quantities, it stopped almost at once, as the holes quickly became sealed up by the coagulation of the sap within them.—*Malay Mail*, Jan. 19.

TAIPING, 4th Dec. 1897.

BRITISH CENTRAL AFRICA.

We have received the following notice with reference to last season's coffee sales. The coffee in question was grown by Mr. S. Israel on the Chipande estate. Messrs. Garner & Co., have written as follows to Mr. Israel:—"The prices for your coffee sold are most satisfactory: in fact that is the best sale that has ever come under our notice of British Central Africa coffee, and we must congratulate you on the very excellent turnout. The average price obtained of 100s per cwt, the lowest, 15 bags, 78s per cwt, the highest, 18 bags. 114s per cwt.

CALOTROPIS PROCERA AND GIGANTEA

Liotard, in his pamphlet "Materials in India suitable to the manufacture of paper" says, that "in the Punjab the fibre is available from the branches of *C. procera* by cutting down the largest branches in October and November or April and May, or the periods when the *muddar* blossoms and just before it ripens its seed." The plants, wherever I have observed them, seemed to be almost in perpetual blossom and the fibre, if I remember aright in Sind is available from *C. procera* all the year round. Of Thana I am not in a position yet to speak; but I may mention that I have extracted the fibre from *C. gigantea* when not in blossom. Whether the fibre extracted is of use or not commercially I cannot say, but there seems no difference in its quality. I may satisfy those like Mr. Gleadow, however, who possess qualms of conscience as to the quality of *C. gigantea* and *C. procera* being equally good, by saying that Mr. Macdonald the expert who experimented with *C. gigantea* fibre in November last in the Konkan declared it to be excellent. I had sent home specimens of *C. procera* fibre to his firm and it was entirely owing to the excellence of the quality of this fibre that Mr. Macdonald was induced to come out to India.

Apart from this, if authorities such a Dalzell (Bombay Flora in 1861, page 14); Drury, (Useful Plants of India 1873, page 101); Liotard and Royle, (Fibrous Plants of India 1855 pp. 306 to 310), are consulted, the assertion that the fibre of both plants is equally good will, it is thought, be found to be confirmed. The only questions to be solved, I think, now are, whether there is sufficiently large quantity of the fibre available from *C. procera* and *C. gigantea* in their natural state to render it marketable in various parts of India and if not whether there are areas which can be taken in hand for the artificial production of the plants, and whether any machine will extract the fibre

in a merchantable condition. On the latter point, I may say that Messrs. Boyle & Co.'s representative, Mr. Macdonald, visited Thana in November, but not with his machine, and after conducting experiments with the cut stems of *C. gigantea*, came to the conclusion that his machine, which is utilized extensively in the Straits Settlements for extracting Rhea fibre, could extract fibre from *C. gigantea* with certain slight modifications. He is so convinced of this that he has addressed the Bombay Government to obtain certain concessions to exploit the fibre in Bombay for a lengthened period. The action taken by Messrs. Boyle & Co. tends rather to upset the conclusions previously come to by Dr. Watt, who conducted experiments on the fibre in conjunction with Mr. Cross of Lincoln's Inn and who says (Dictionary of Economic Products Vol. II. page 40.) "The opinion we arrived to confirms the verdict already given that the mechanical difficulties are too great and the ultimate fibrils too short to justify high hopes being entertained of *Madar* bast fibre becoming of any great commercial importance, although its great beauty makes one resign it with regret."

Mr. Gleadow appears to be of opinion that the plant is of such a straggling light-demanding habit, that it could not probably be grown dense enough to give any considerable yield: but he seems not to have made any experiments on the point. In qur. Strettell's pamphlet on *C. gigantea* published in 1878 (page 73) he gives the yield of fibre per acre at 582 lb. or 727 lb. where waste is guarded against, and I have never seen his estimate controverted.

30th Dec. 1897. G. M. R.

—*Indian Forester*.

THE FIXATION OF ATMOSPHERIC NITROGEN BY DEAD LEAVES.

Following the important work of M. Henry, whose successful research will be doubly grateful to many Indian foresters for reasons of personal regard, comes a note by M. L. Detrie on the same problem, *viz*., the reasons for the continual improvement of forest soils, notwithstanding the fact that more nitrogen is removed from them than is known to be acquired by them. The disastrous results of the removal of dead leaves, causing sometimes a loss of as much as 50 per cent., of the normal annual production, are well known to foresters, but have not yet been borne in upon the unwilling minds which oppose forest conservancy. This loss, at any rate the most serious loss is nitrogen. As regards sufficiency of other food supply, it may be granted that all soils, all waters, all atmospheres are rich enough to keep forests growing for ever. The mineral constituents, salts, &c., necessary to the continued formation of cellulose, starch and other reserve materials, are always to be found in sufficient quantities, resulting from decompositions or recombinations in the soil or atmosphere. But nitrogen, the indispensable, the arbiter of the rate of growth, even of life and death, is an extremely variable quantity. The German experimental stations proved the *amount of loss growth* caused by the removal of dead leaves. M. Grandeau showed that the covering of dead leaves has a great influence on the *amount of nitrogen carried in the soil*. Then came the knowledge of the important part played by micro-organisms, moulds, ferments, microbes &c., in the decomposition of vegetable matter, and it was seen that the layer of dead leaves is not only a layer of partly digestible food material, but is especially a layer of microbes, ferments, &c., a kitchen in fact, where the indigestible materials are rendered easily assimilable. It follows that the mere raking about of the layer, not to speak of its removal, interrupts the microbe-cooks and the scullion ferments at their work, and may even kill and bury them under the ruins of their kitchen.

The removal of leaves is thus a wasteful process, since the benefit accruing to the robber is far less than the damage caused to the forest. About this period, namely June 1893, M. Detrie just glimpsed the conclusions which M. Henry has worked out, since he wrote that "the removal, or mere moving, of the layer of dead leaves, not only interferes with the formation of vegetable mould, but actually *diminishes the fixation of nitrogen in the soil by stopping the development of micro-organisms*." It remained for M. Henry to decipher the details. Even yet, there are illegible lines at the bottom of the page, and M. Detrie asks for an interpretation. Granted that the increment is affected by the chemico-physical action of the layer of dead leaves, how can this be reconciled with the admittedly greater increment in the standards after the cutting of the coppice, that is to say, at a period when the layer has been practically destroyed? M. Bartet's experiments showed that in high forest of 3 ages, up to a height of 9 m. 30 cm, the curve of diametral increment is inflected from the 1st to the 3rd decennial period, that is, inversely to the thickness of the layer of dead leaves. The cause of this greater increment is not explained, although theories more or less at variance with existing knowledge have been propounded. The problem has puzzled M. Detrie for the last 10 years, perhaps some Indian forester can throw light upon it.—*Indian Forester*.

Indian Soils and Differing Authorities.—The final Report of Dr. Leather as the subject of consideration in the *Indian Agriculturist* and from the conclusion of its article, we quote as follows:—

Professor Wallace, of Edinburgh, it will be remembered, in his work on Indian Agriculture, answers with an emphatic negative the question whether the fertility of the soil is being exhausted by native practices. "Temporary fertility, the qualities possessed in virtue of some accumulation of material useful to plants, may," he says, "be dissipated; but when this is gone, no system of cropping can reduce the land to a lower point. The greater portion of the land in India which is not newly broken in, annually produces its minimum yield. Where declining fertility has been recorded, it was no doubt due to loss of temporary fertility which had accumulated during a period of rest." Dr. Leather, however, points out that the distinction between temporary and natural fertility of soils is only a question of terms, and maintains that, while "the presence of a store of 'temporary' fertility in the past may or may not be the case, the opinion that a soil cannot be reduced in fertility below a certain level is one for which there is absolutely *no* proof; on the other hand, we have the *fact* that in the Rothamstead and Woburn experimental fields in England, crops which have been grown for so many years without the aid of manure, do annually become less and less, and the limit (if there be one) has not so far been reached." However this may be, moreover the fact, as he points out, remains, that it is much more important to consider how the fertility of the land can be increased than whether it is becoming exhausted. It is beyond doubt not only that the fertility of the land in India is low compared with that of the land of other countries, but that, if it is not decreasing, it is certainly not increasing, and, with a better supply of manure, it would be at once increased and more grain produced per acre. For that better supply of manure, he is rightly of opinion that there is, under Indian economic conditions, but one principal source, viz., the dejecta of the animals and human beings that consume very nearly the whole of the grain crops; and "it is in the more perfect direct (not indirect) return to the land of these matters, that one can look for an increased manure supply, an increased fertility an increased out-turn of food-grain." As bearing on his remark that the fertility of the land in India is low compared with that of the land in other countries, Dr. Leather states, it may be noted, that, of all the Indian soils he has met with, the only soils to which the term "rich" can be at all applied were from a single limited area, viz., a coffee estate in the Shevaroy Hills.

PLANTING NOTES.

Fibre Industry.—We direct attention to an interesting extract from the *Indian Forester* in our issue in continuation of what has already appeared about the fibre got from different species of *Calotropis*. It will be observed that Mr. MacDonald (of Ramie fame) reports very favourably of *C. gigantea*—the "Warra" of the Sinhalese. We must watch the further development promised in India.

"The Queensland Agricultural Journal," for Jan' 1898—Contents:—Students at Agricultural Colleges—The Queensland Agricultural College—Wagga Experiment Farm—Agriculture: Green Manuring and Farm Drainage—Dairying—The Orchard—Entomology—Botany—Economic Botany—Tropical Industries: Ramie Cultivation, Coffee prospects in Queensland, On Fibres, and The Coconut (*Cocos nucifera*)—Bacteriology—Chemistry—Pisciculture—Forestry—General Notes—The Markets—Farm and Garden—Notes for January—Orchard Notes for January—Tropical Farm and Garden Notes for January—Publication Received—List of Errata in "Insect Friends and Insect Foes"—Public Announcements.

Some Rare and Expensive Drugs.—A writer in the January number of *Chambers' Journal* throws some interesting light on rare and peculiar drugs. Saffron, he points out, would strike an ordinary observer as decidedly expensive at 56s a pound, until told that it is composed of the central small portions only of the flowers of a Crocus, 70,000 of which it takes to yield the material for one pound. Otto of Roses sells as £28 odd per pound, and it takes 10,000 pounds—or nearly five tons—of Roses to obtain one pound of the oil. Aconitine, extracted from the root of Monkshood, is said to be the very strongest poison extant, the dose being 1-600th of a grain. It is sold at the rate of £27 per ounce!

Coffee Prospects.—The year is notable, says the *American Grocer*, Jan. 5, for a heavy decline in prices, due to an enormous increase in the crops of the world, only partially offset by an increase in the deliveries, which are reckoned as consumption. The latter shows an increase of over 7 per cent, over 1896. The decline in prices has been most marked in Brazil it sorts and lower grades of mild coffee On January 1, 1897, the worlds visible supply was 4,024,968 bags, since increased to about 6,500,000 bags, notwithstanding the gain noted in consumption. We have recently so fully outlined the position of coffee, and noted each month in detail the movement, that a further review at this time would be a needless repetition. The outlook is for a period of heavy supplies and low prices for at least two years to come. The aggregate of the world's crop is over 2,500,000 bags above present annual requirements.

The "Indian Forester," a monthly magazine of Forestry, Agriculture, Shikar and Travel. Edited by J. S. Gamble, M.A., F.L.S., Conservator of Forests and Director of the Forest School, Dehra Dûn. Contents. No. 1—January, 1898:—Original Articles and Translations. The Fixation of atmospheric Nitrogen by dead leaves; Imports by Quebracho wood into Germany. Correspondence.—The After-training of Ceopers Hill men, letter from Dr. W. Schlich, C.I.E.; India Rubber, letter from J. R. Jackson; Calotropis procera and gigantia. letter from G. M. R. Official Papers and Intelligence.—Cacao and India Rubber in Mexico (Extract from Foreign Office Report No. 385, of 1895, Miscellaneous Series, by Mr. H. N. Dering). Extracts, Notes, and Queries. Experimental Morphology; British Woods and Forests; Pine Wood at the Cape. Timber and Produce Trade; Extracts from Official Gazettes.

The Kalutara Planting District—to judge by the annual report we give elsewhere—is in a very happy way as regards cheap transport, and a plentiful contented supply of coolies—this latter due to a District Federation. There is encouragement therefore to Federate all round. But in the state of the roads, the Kalutara planter has abundant cause for grumbling, apparently. It would never do for a planting district to exist without a grievance!

North Borneo Ramie Fibre Co., Ld. (3,704).—Regd. at Edinburgh, Dec. 20th, with cap. £15,000, in £1 shs, to purchase and acquire from Malcolm C. Thomson, of 25, Hope St. Glasgow, a concession of 5,000 acres of waste land in B. N. Borneo, for the cultivation of Rhea or Ramie and other fibrous plants. The subs. are:—

M. Thomson, 25, Hope St. Glasgow, mcht	1
A. McRay, 25, Hope St. Glasgow, cashier	1
M.B. Thomson, 25, Hope St. Glasgow, mfr	1
M. B. Thomson, 25, Hope St. Glasgow, clk	1
W. Carswell, 25, Hope St. Glasgow, mngr	1
J. Murray, 82, W. Regent St. Glasgow, C.A.	1
A. Mitchell, 82, W. Regent St. Glasgow, C. A.	1

First directors are M. Thomson, R. King, and R. Paterson; qualn, 100 shs. Regd. office, 82, W. Regent St. Glasgow—*Investors' Guardian*, Jan. 1st.

Tea Chests.—A notice has been received in Calcutta from the Secretary of the Liners' Conference to the effect that "in consequence of the insufficiency of metal chests in practical use" the Conference has decided that no claims for ullage will be paid on metal packages by steamers proceeding from Calcutta on and after February 1, next. A copy of this notice having been sent to the London Association the Secretary applied for information regarding any claims that had been made. The Secretary of the Calcutta Conference states in reply that he regrets he is not in possession of the particulars asked for. The only information furnished by the Liners respecting the matter was that several claims of the class referred to had been made, and as they were considerably on the increase it was decided to carry out the resolution referred to. We understand that a protest has been lodged against the action of the Conference in this matter, and that a request has again been made for full particulars of claims.—*H. and C. Mail*, Jan. 14.

Gold and Plumbago in Ceylon.—A great mistake will be made if the experienced Mining Engineer (Capt. Tregay) who is now open to engagements, is allowed to leave the island without advantage being taken both by the Government and private proprietors to get reports on likely plumbago land or likely gold-yielding quartz reefs. The Government Agent of the North-Western Province must know how much Crown Land is enhanced in value if it is pronounced to yield plumbago, and he ought to point out to Government the great benefit of getting Capt. Tregay to examine and report in likely divisions where land is to be sold. We understand that native proprietors of land are beginning to ask Capt. Tregay for reports. Then as to gold, surely proprietors in the neighbourhood of streams known (by their native names) to yield gold:—Ruanwella, Rangalla, Ramboda, Ranwelle, &c.—will not lose the chance of an expert like Capt. Tregay tracing the matrix quartz from the stream. In the case of the Kelani Valley above Ruanwella, we would advise the District or at least a group of proprietors to associate in employing Capt. Tregay. We know the old objections offered by planters to a gold-rush; but a gold-yielding quartz reef can be worked just to suit the convenience of the owner; no rush can well take place on such a reef.

TEA IN NORTH BORNEO.—We read in the *Herald* Mr. Ballardie and Mr. H. Walker went on up river to Sapong. Mr. Ballardie has come as the representative of an influential Company who are about to commence planting tea near Sapong.

"PLANTAIN FLOUR."—Who can tell us if this article has been prepared in Ceylon, and whether any quantity can be got at this time? There is enquiry for it from abroad and we cannot see why an industry and trace should not be developed in plantain flour, in a country where plantains grow so freely.—See a letter and enquiry elsewhere.

COFFEE RIVALRY.—The report of the Government of India on coffee cultivation affords another instance of the way in which the fortunes of distant and disconnected portions of the earth linked together, says the *Globe*. Take coffee. In the heart of India, a circumscribed zone might be marked out, including the districts of Mysore and Coorg, Malabar and the Nilgiris, which would be practically the whole of the coffee-bearing region under the Indian Government, and if we turn the terrestrial globe completely round, we shall find a similar coffee region on the other side of the world, in Brazil. In spite of geographical distance, when the naked coolie of Mysore finds work scarce and wages low, he may safely attribute it to the fact that prosperity is smiling upon his antipodean counterpart. This fact is very clearly brought out in the report of the Government of India. From 1876 to 1878 inclusive, Brazil was in political trouble, and the Indian coffee grower made such handsome profits that cultivation rapidly extended. Then came India's trouble in the shape of the coffee-boring insect and leaf disease; and Brazil ruled the market, while unremunerative Indian coffee plantations began year by year to give place to tea-gardens. But in 1889 the pendulum swung the other way once more. Science had defeated the coffee borer and rendered plants immune against the leaf disease in India: while American "corners" in Brazilian coffee and fresh political troubles gradually enabled the price of Indian coffee to rise in 1893 to double the price that ruled in 1885. Brazil is still more or less troubled, and the coffee of India still rules high; but assured peace and prosperity in Brazil would promptly send prices down again.—*H. & C. Mail*, Jan 21.

CEYLON TEA IN NORTH AMERICA.—In another column we publish a letter from our Tea Commissioner, Mr. Wm. Mackenzie, in which he points out how the prices of low grade teas are being kept up through orders from Russia and America chiefly, and how the blending houses, not being able to get these teas at their own prices, give less bids for mediums. Shares of recently formed home Companies are stated to be rising and our Commissioner thinks it is almost time for a Growers' Distribution Co. to be formed. With regard to the enclosures these include as the letter mentions the list of eighteen packet teas in Toronto, and instructions to Customs officers to forward to the department at Ottawa, for approval, samples of all tea imported into Canada from the United Kingdom and from the United States before delivery, unless the importer produces a certificate from the British or U.S. Customs that the tea has been duly approved for home consumption in their respective countries; and to exercise due care that tea which is unfit for use and such as is prohibited under the customs tariff shall not be entered for consumption in Canada where thus imported direct or in transit from foreign countries. In such cases if custom officers have reasonable grounds to suspect that a particular tea is not genuine, or that it is mixed with exhausted tea or other ingredients so as to injure its proper quality, a sample of the tea is to] be tested at the port of entry.

COTTON GROWING IN SOUTHERN INDIA.—We get very bad accounts of the prospects of cotton growers over the way in Tinnevelly: high exchange has so affected the prices offered by the mills and export traders that there is no margin of profit left to the cultivators who, therefore, *are not likely to grow cotton in their fields next year*, where they can manage otherwise.

CONWAY PEARL FISHERY.—Sir Walter Besant in *The Queen* has the following :—

I have received more details concerning the Conway pearl fishery. As regards the upper reaches of the river the fishery is extinct. It existed, however, continuously from Roman times to about thirty years ago. Probably, therefore, it may be resumed some time with profit. The causes of the decline are said to be partly the demand for *eating* mussels—to eat a mussel that, if left alone, would produce a pearl is surely akin to killing the goose with the golden eggs—and partly from too great a drain upon the beds, which reduced the size as well as the quantity of the pearls. The time for fishing was between the months of May and August exclusive; during that time "several pounds weight" of pearls were found daily. Mounds from 10 to 15 feet high, consisting of mussel shells and sand, exist in the neighbourhood to show the magnitude of the operations. Last year the Mayor of Conway was presented with a ring set with black pearls from the river. It seems a pity that so picturesque an industry should fall into decay. Meantime, it has interested me greatly to read these details, and to learn that there has been for so long a fishery for pearls in our own country.

GOOD NEWS FOR CACAO PLANTERS.—The extraordinary activity in the cocoa market, and the substantial rise in prices in face of a large supply at the resumption of public sales last week, show—says the *Grocers' Journal*—what a change has come over the scene in regard to this article of consumption, and what strides it is making in public favour. Although great quantities have been accumulating during the holidays and the catalogues were therefore exceptionally heavy, all grades were actively competed for and substantial advances were recorded in all departments. Grenada sorts showed the full effect of the improved position, prices being 8s to 12s per cwt. above the value ruling at the last auctions in the old year, and while everything was cleared, the market closed strong. Our contemporary goes on to remark :—

Never were the uses of bold advertisement better exemplified. That cocoa is an article of diet of great value has been known to the faculty for many years. But the heavy character of the usual decoction kept it back for years, and when the essences and powders appeared, though they made a certain headway, they were unable to dive straight to the stomachs of the people as tea has done. But of late there has come a remarkable change. Manufacturers everywhere have been waking up to the fact that merit alone cannot get an article into consumption. It needs an adventitious aid. As our readers know cocoa has found it. One can see it everywhere. Grocers can testify to the increased demand, especially for certain brands, and the public are realising, now that it is being borne home to them, that—whatever the merits of rival cocoas may be—the genuine article, in any and every form, is of great value to them in their ordinary dietary. Manufacturers may now be said to be fully employed in meeting the demand which has sprung up in response to the liberal appeals in the press of late. And we can at the more rejoice this and wish for its continuance when we reflect that it is unlikely to disturb the balance of trade in cognate goods, being in large measure, merely in addition thereto.

CURRENCY, DEAR MONEY, FINANCE AND TRADE IN INDIA.

A LEADING CALCUTTA MERCHANT SPEAKS OUT TO SOME PURPOSE :—

"INDIA'S GREAT CURRENCY PROBLEM CAN BE SOLVED BY OUR FIELDS AND BY HER LOOMS AND BY THEM ALONE."

WE have seldom if ever read a more convincing address on the Currency and Financial problems which for five years have disturbed India and Ceylon, than that afforded by Mr. David Yule,—a leading Calcutta merchant,—as Chairman of the half-yearly meeting of the Bank of Calcutta, Limited, on the 29th ult. It has reached our hands in pamphlet form and we cannot refrain, great as is the demand it makes on our space from giving it in full, so special must be its interest to every planter, nay every producer, merchant, banker, and trader in Ceylon. "Them's my sentiments" may well be the response to nearly every division of Mr. Yule's address and the marvel is with such convincing evidence of the evil inflicted on the opposite Continent—its agricultural millions, its manufacturing and industrial sections, bankers and traders, that no definite action by a Public League has been taken long ago to counteract the utterly foolish policy of the Government financiers.

We can assure Mr. Yule that all Ceylon is ready to back him, and to form a League tomorrow to secure a return to the sound automatic working of Exchange which prevailed previous to 1893, a condition which very lately Mr. Henry Dunning MacLeod—acknowledged to be one of the highest living authorities on Currrency. Banking and Finance —pronounced to be a perfectly safe and sound one for a country situated as India was. We can fancy how readily Mr. Bethune (whose recent speech will be found on our sixth page), Mr. Joseph Fraser and other leading Ceylon planters as well as the Hon. W. W. Mitchell representing our solitary Spinning and Weaving Mill, will endorse what is said.

CEYLON TEA IN RUSSIA.

Mr. T. N. Christie has just received a cutting of an advertisement which has been appearing recently in all the Moscow papers, and sends it to us together with a translation as being of interest to our readers. The translation is as follows :—

CHINA-CEYLON TEA.

There has of late been a great increase, which still continues to grow, in the use of a tea consisting of a mixture of China tea with that of Ceylon and others, without a *single firm* selling such mixture *making any mention* of that fact on its labels. Thus the consumer is quite ignorant whether he is drinking China tea, Ceylon tea, or a mixture of the two.

The Company has hitherto *had* and *will always continue to have* on sale separately both *pure China tea* and *pure Ceylon tea*. Yielding, however, to the demands of buyers, the Directors have arranged for the sale of a tea consisting of a *mixture* of China tea with Ceylon tea, but in order not to anywise lead astray the public as the tea they are using, have decided to call the new issue of tea *by its proper name*: "*China-Ceylon tea*," which name is printed on the labels. BROS. K. & S. POPOFF.

We are extremely pleased to see this important Russian Tea House taking so much interest in Ceylon teas, and arranging to sell our teas pure as well as in blend.

YOUNG CEYLON IN BRITISH EAST AFRICA.

The following letter received from Mr. A. P. Wijeykoon, one of the medical men who proceeded to Uganda in December last, will be useful to others who intend to follow in their wake, says our legal contemporary :—

"We reached Klindini on the 5th instant and reported ourselves to the Chief Engineer, who referred us to the P. M. O. Dr. Carie, whose instructions were that we were to remain here till we learn the Hindustani language. I am House Physician, Oorloff House Surgeon, and De Jong is in charge of the oxygen treatment for Ulcers, &c., which was introduced after our arrival. After we pick up a little Hindustani, two of us will be sent upcountry to attend to the men there. The Department seems to be very shorthanded and I expect that they will indent for some more men. The place does not seem to be so bad as we were led to believe. It abounds in fruits, such as bananas, coconuts, jak, mangoes, cajunuts, papaya, &c. The water supposed to be drunk is condensed water from the sea, but most of the people use well water. In addition to our pay we get our diet which consists of rice, dhall, curry stuffs, ghee and flour, &c., also two lb. of ice a day for each man."

COFFEE, COCONUTS AND CULTIVATION GENERALLY IN BORNEO.—In an official Report for 1897 on North Borneo, we read :—

Some gentlemen in Ceylon formed a Syndicate to cultivate coconuts in Borneo and Mr. A. E. Wright and a Sinhalese expert arrived here during the year and reported well on the soil.

And later on, we have the following record :—

Cultivation.—In general terms the Territory has progressed during the past year despite the fact that one tobacco estate has closed, with as yet no fresh opening, and that one or two products have given less satisfactory results than were hoped. Tobacco.—The prices as yet realized have been quite up to expectation. Bilit Estate was finally closed early in the year, but search has been made for suitable new land both on this and the West Coasts. A restricted area has been selected at Tawao, but home companies require much greater room, and it is believed that the early part of 1898 will see new land opened in Province Dent. Coffee.—The fall of home prices has had an effect on local enterprize in this direction, and it is generally felt that other products must be relied upon if money is to be made. The various gardens are however looking well and a fortunate turn in the market may restore it to former favour. Gambier.—This is flourishing and still maintains its price. Coconuts.—These seem to offer one of the best chances of making profit open to residents. The demand for coir, oil, copra, &c., is rather growing than decreasing, and the only drawback is the length of time which has to elapse between planting and gathering the nuts. Hemp.—This is being grown successfully at Suan Lambah, the only drawback being the want of cheap labour, and it is generally admitted that machinery must be used to secure profitable results. The next few months will determine the question Rhea.—This is also being planted extensively and offers a better chance of good results, the price being higher than of hemp. But here again machinery is necessary and the remarks above made apply to this product also. Pepper.—This is grown only on a small scale by Chinese and does not figure largely as an export.

THE CACAO DISEASE.

A RECORD OF ITS RAVAGES.

There is abroad some sore feeling in regard to the cacao disease: those whose places have been spared inclining to "cut up rough," and would have no mention made of it, for fear cacao property should be depreciated. But it is a thousand pities that the "hue and cry" had not been started earlier. Much money might have been saved, and by this time we might have been well on the road to successfully combating the pest. As it is, the inquiry is just beginning; and although we hear now and again that one local scientist is on the track of the enemy, has marked him down, and will be his death erelong; yet it is but the wish being the father of the thought—the thing is only in the air. Mr. Carruthers has not himself spoken and while he is silent, things pretty much remain as they were. We have no wish whatever to exaggerate the extent of the harm done, not the strenuous efforts which must yet be put forth to stamp the pest out; for it goes without saying that in a land like this—the very paradise of insect and fungoid life—it will not be exactly a "walk over" which the cacao planters will have. Nevertheless, if there be hope, the men who grow cacao will undoubtedly be ready to grapple with the enemy, and have a sturdy wrestle for the mastery.

Up to this time, so far as we know, facts and figures as to the extent of the harm done, have not been forthcoming. Those who minimise the evil, speak of a tree here and there dying out, jauntily refer to it as a thing to be expected, common in all kinds of cultivation; and trace the cause to 'wet feet,' improper conditions of the soil, or *anything* in fact. It ought never to have been referred to at all, they say, and especially in the public prints. Those who have been and still are "under the harrow" have already enough to put up with, and do not particularly see what the public have to do with their bothers and losses. It is hard enough to bear them without being made an object-lesson for an agricultural community. All this is natural enough, and we are inclined to sympathise with both classes. Happily there is a third class, who, with the view to emphasise the need of action, are neither so sensitive nor reticent as the others, and we are today able to give the cacao crop, gathered from 110 acres, for the last six years. The planter who has obliged us with these figures does not desire that the name of the property should be known, nor that his own name should appear, but we know of what we write, and can vouch for the correctness of the figures. The crops run as follows:—

		cwt.	qr.	lb.			cwt	qr.	lb.
1892	..	318	2	1	1895	..	317	1	25
1893	..	432	0	17	1896	..	329	1	26
1894	..	394	3	3	1897	..	193	2	12

The disease first appeared on the estate at the end of 1894, but not until last year did it become very bad. The figures given are eloquent enough, and perhaps those planters who are inclined to charge us with the sinister motive of depreciating cacao property, exaggerating the evil, and such like nonsense, will now be convinced, that there is a constituency in Ceylon who feel that the publicity which has been afforded to this serious matter was certainly called for. The existence of the evil was smothered too much at the outset, and now it would seem as if the day of reckoning had fully come.

At present the Planters' Association is issuing a circular to all cacao growers, asking for support toward remuneration of the scientific services of Mr. Carruthers, whose aim, as we all know, is to find out a cure for the cacao disease. That this appeal will be well supported we doubt not, and the sum needed is not a big one. If the ravages of the cacao disease are to mean in all gardens where it appears, anything like what it has cost the proprietors of the estate whose returns we have been permitted to quote, then we need offer no word to press upon cacao-growers, to support the call now made upon them. Self-interest alone will be reason enough to open their purse-strings, not to speak of anything more public-spirited. Now that the needed Cryptogamist is in the Colony, and that the field for his investigations is clearly defined and wide enough in all conscience, Mr. Carruthers' valuable services should certainly be retained until our Cacao planters feel that the Scientist has his hand on the throat of their enemy, and that its destruction and expulsion are in a fair way to be compassed.

RICE FROM SOUTHERN INDIA.

THE RECENT VISIT OF ENQUIRY BY CEYLON PLANTERS.

Report of a deputation, which visited the principal centres of S. Indian rice trade—viz., Negapatam, Tanjore, Shiyali, and Cuddalore—all of which are included in the special reduced through-booking scheme of the S. I. Railway.

NEGAPATAM.—This place was visited on the 23rd of January 1898. It is the centre of the *sea-borne rice* trade of S. India, although comparatively little rice is grown in the immediate neighbourhood. The evidence taken at this place was, therefore, exclusively that of shipping; chetties and their brokers and not of cultivators. The distance from Negapatam to Tuticorin by rail is 265½ miles; to Colombo about 415½ miles via Tuticorin; from Negapatam by sea direct (via Paumben) to Colombo is 260 miles more or less. It is, therefore, eminently satisfactory to have elicited from these people the opinion that in the North-East monsoon (at least) transit by rail to Tuticorin, and thence by sea to Colombo is preferable to direct shipment from Negapatam to Colombo.

The Nagapatam dealers expressed their willingness to send periodical samples and quotations with a view to direct dealing on the lines laid down by the deputation, which will be referred to later.

TANJORE.—Visited January 24th, 1898. Distance from Tuticorin 217½ miles by rail. Tanjore is the principal rice-growing district. It has a permanent irrigation system from the river Cauvery, and quotations from this district should be less liable to fluctuations than less favoured districts. The persons interviewed here were not owners of land or cultivators, but were buyers of paddy, who employ labourers to convert the paddy into rice, which they afterwards vend.

SIRIMANE AND SEMBALA.—They produced samples of two grades of rice, which are locally known as Sirimane and Sembala, which are known to us as Mootoo-Samba and Kalunda.

For these they quoted free on rail in double gunnies.

Mootoo-Samba R7·06 per bag of 190 lb. gross.
Kalunda R6·51 " " " " "

The samples shown were certainly superior to the rice of similar grades sold in Ceylon, and distinctly cheaper, say, R3·13 per bushel in Colombo for Kalunda, including all commissions and agency charges.

After this interview with the dealers the deputation was approached by four rice cultivators (land-owners) who wished their address registered with a view to direct dealing with our Agent.

CUDDALORE.—Visited January 25th. Distance from Tuticorin 316 miles. Only one cultivator was interviewed, but this place (the most distant of the tour) has produced two firm offers of rice in large quantities—but of qualities not suitable for Ceylon requirements.

SHIYALI.—Visited January 25th. Distance 281¾ miles from Tuticorin. This was the most largely-attended meeting of the tour. The persons interviewed included both merchants brokers and proprietors-cultivator. The deputation found that business had been carried on direct between Shiyali and Colombo for some time, through Agents in Tuticorin and Colombo, and are of opinion that it will be easy to arrange direct dealings with this place although rates quoted on the spot were somewhat in excess of Tanjore figures.

The deputation were particularly struck with the enormous acreage under rice between Cuddalore and Tanjore, and its healthy appearance though no rain had fallen for some months owing to the failure of North-East monsoon.

CONCLUSIONS AND RECOMMENDATIONS.

1. That the through booking of tice should be strongly recommended to the notice of the Planting and Mercantile communities as profitable to both.

2. That not more than two persons (acquainted with the rice business) go to Southern India about March 1st or thereabouts—if possible in company with a future South Indian Buying Agent.

3. That they purchase rice in various places at the best rates then obtainable—guided by the average Colombo quotations for South Indian rice.

4. Meanwhile arrangements should be made for the appointment of 1st. An agent (European on the Coast.) 2nd. A distributing house in Colombo.

Note.—Without these, direct business between planter and rice-grower would probably prove unsatisfactory, in view of the universal desires of these interviewed for an agent, with whom they could deal directly, and who would be responsible for the conditions of payment, and for the quality of rice purchased by him at the centre of supply.

The distributing-house would have to split up consignments of rice, which would often be too large for individual consumers, (one truck load of 72 bags or say 200 bushels being the smallest quantity accepted at through booking rates.) It would also check quality and weight in the interest of the consumer, and make general arrangements for financing consignments.

Note.—It must be borne in mind that the concession (nominally a reduction in freight of 12 cents per ton) made by the Ceylon Government Railway is of no practical use whatever, and that it is a concession at all is not borne out by actual figures before the deputation. On the contrary the Ceylon Government Railway appears to have (while granting an apparent concession) quoted to the South Indian Railway slightly more than rates actually levied by the Ceylon Government Railway. There is therefore no objection to booking through only as far as Colombo, where trustworthy agents could deal with the rice to their own profit and the convenience of customers.

6. The deputation therefore recommend that planters co-operate in supporting a Central Agency in Colombo with an agent on the coast, and consider that this agency could profitably do business at 2½ per cent. commission to approved constituents on the ordinary terms of local business.

CONDITIONS OF PURCHASE, AGENCY, &C.,

as suggested by the deputation and generally approved of by dealers, cultivators, agents, and others interviewed.

1. The unit of purchase to be by weight, viz: the bag of 190 lb. gross in double gunnies—*i.e.*, about 186 lb. nett rice.

Note.—The mean weight of new rice appears to be 62·656 lb. per bushel, and of old rice 65·728 lb.

2. No advances or forward contracts to be made except by special agreement.

3. All prices to be quoted free on rail, bags and all petty charges included.

4. Payment to be made by drafts at 14 days after sight (negotiable at the nearest bank or agency to the place of purchase) on production of the South Indian Railway receipts.

5 Rice to be at buyer's risk against loss in weight or sea* damage from date of delivery on rail.

6. Commission to be at 12½ cents per bag for agent in South India,

Memo.—It is evident that the Distributing Agency (to avoid loss on individual consignments) would have to charge a covering rate, and the deputation recommend that such profit be divided 50 per cent to go to the constituents of the agency—*pro rata* to their individual purchases of rice, and 25 per cent each to the Colombo and South Indian Agents.

In conclusion the deputation wish to put on record their hearty thanks to Captain Shelly and many other officials of the South Indian Railway for their assistance in facilitating the collection of evidence, to the Colombo Agents of the B.I.S.N. Company, and to the various gentlemen who helped the deputation with their advice and information.

NOTE.

The addresses of cultivators, merchants, brokers, South Indian firms, and individuals willing to do business on the lines indicated by the deputation, may be obtained on application to the Secretary, Ceylon Planters' Association, who has been furnished with a verbatim report of the evidence collected on the spot.

(Signed) A. MANSFIELD FORBES, PHILIP F. RYAN, GEO. C. BLISS, A. M. CARMICHAEL, JAMES RYAN.

[Appended to the report is the circular regarding the through booking of rice, with useful hints and full details as to charges.]

THE CULTURE OF VANILLA IN WEST AFRICA. The experiments in vanilla culture in the German colonies of West Africa have, so far, been successful, and the plants appear to be becoming acclimatised, It is believed that these colonies will furnish as good vanilla as that from Reunion. The most important plantation is that of the Catholic mission of Bagamoyo.—*Apotheker Zeitung.*

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* Cost of insurance by Messrs. Adamson, McTaggart, & Co is R2 per 6 ton waggon load or about 1 cent per bushel.

CINCHONA BARK: ITS "CONTROL" AND PROSPECTS.

Our friend, Mr. G. Mundt of Java, has been doing good work for the Cinchona planters, while in Holland and has at last succeeded apparently in securing such a union of cultivators and importers as may defy the alleged German combination of manufacturers of the alkaloid. In Amsterdam there is a Commitee or Council of the Association for Promoting the Interests of Cinchona Culture, which lately called two meetings of the importers of Cinchona Bark. At one of these, Mr. Mundt, who is a very powerful personality amongst Java bark growers and importers, gave those present at the meeting such strong encouragement and assurance of support from Java that hesitation was at once put aside and specific clauses of agreement drawn up. The meeting agreed,—

1. A committee of five, representing consignees and planters, to be entrusted with the direction of the operations.
2. No cinchona to be offered except at auction.
3. The quantity to be so offered to be limited to the requirements as estimated by the committe, if necessary, after cousultation with the importers, and to be taken proportionately from the supplies declared available for sale by the importers, twenty-five days before the auction day; no lot to be split.
4. If necessary, a minimum limit to be fixed before each auction by the committee in consultation with the importers.

The following were elected members of the executive committee:—

J. A. C. van Leenwen, F. L. S. van Heekeren, W. J. P. van den Bosch, G. Mundt, and Patrice Cramer.

The committee, in issuing the report of the proceedings mentioned above, appeal for the assistance of all interested in the cinchona trade of Java. Mr. Mundt will shortly return to that island, and endeavour to further the interests of the new cinchona combination there.

In framing these resolutions the manufacturers of quinine have not been lost sight of, but it is somewhat sanguinely expected—says the *British and Colonial Druggist*—"that the German combination will not oppose the action of the bark sellers. In support of this it was said that one of the manufacturers of quinine had declared that the latter would far sooner not have taken the steps which had resulted in injury to the proprietors of cinchona plantations, and that they would not regret an understanding being arrived at amongst such proprietors. It is probable that the manufacturer who uttered these sentences was quite sincere, but speaking at a time when such a combination of importers and planters appeared impossible, he would be in a far different frame of mind from that with which he would regard a strong and united ring amongst the sellers of the crude material with which he worked. Anyhow, we shall soon have the opportunity of seeing how this gentleman and other quinine manufacturers regard the new departure. Everyone interested in the quinine and bark markets will follow closely the next three auctions in Amsterdam, which are in the nature of an experiment to decide forthcoming plans. When those have passed, we, like the importers, shall be able to speak more confidently as to the future.".

From the report of the Amsterdam meeting we quote some interesting passages :—

A good many cinchona planters imagine that the erection of quinine factories in Java has gained their point for them; the future, however, will in all probability show that these planters are mistaken. Much, very much is gained by the erection of those factories: but most certainly not everything, especially as regards the immediate future.

In order permanently to relieve the cinchona market it is necessary that proprietors of cinchona undertakings, should place the fullest confidence in the judgment of their importers and that such proprietors should leave their importers perfectly free to deal with the stocks of cinchona bark as the importers think best. When importers have a free hand and will employ the latitude allowed them in a proper manner—and we cannot think that importers will act otherwise than properly—then it stands to reason that the importers and not the ring of German manufacturers will hold the reins in the matter. The result of this will be that the quantities of bark to be put up to auction will be judiciously determined, and that the unit will be fixed in such a way as to allow the proprietors of the cinchona undertakings to obtain a return for the sold portion of their produce, not only appreciably larger than during the last few years they obtained for their entire harvest, but amply sufficient to cover all expenses besides, and to leave a good margin of profit in addition. Besides which, the difficulty of the first-hand stock of cinchona bark becoming too large in consequence of the whole supply not being sold will vanish of itself; for assuredly the proprietors of undertakings will not be so foolish as to incur expense in gathering and shipping bark which they know will be warehoused for an indefinite period by their importers.

To produce a healthy condition, importers, once they have acquired the free disposition of the cinchona bark—at any rate during a series of auctions—will, probably, put coalition against coalition, at least have to fight, if only to convince the manufacturers that there can no longer be any question of dissension. But such a course will not prove necessary in the long run, provided importers be left a free hand. At any rate, while the injurious results of the position hitherto taken up by the proprietors of the cinchona undertakings will, on the one hand, gradually vanish, and the market be placed upon a sound footing, the Javanese quinine factories will, on the other hand, exercise a more and more wholesome influence upon our market, since those factories will be in a position to fight the manufacturers on their own ground if need be.

It may be mentioned that Mr. Massnik, one of the two Java quinine-makers, has written a letter to a local paper in which he states that the *modus operandi* of the European quinine-ring, consisting of four German makers and the firm of Howards & Sons, is as follows:—The members of the ring have placed the control of their sales of quinine in the hands of the *Gold- und Silber-Scheide Anstalt* of Frankfort-on-Maine, or rather of Mr. Andreæ, the director of that powerful chemical-factory. Mr. Andreæ fixes the quantity of quinine which each factory may sell, and its selling-price. He signs all the quinine invoices of the five makers, and he determines in what markets each shall sell. The five makers may buy bark at any price they like, but they always must buy back and as much quinine in the bark as they have sold of the manufactured article. They may buy more if they choose, but not less. It is not certain whether these conditions relating to bark-purchases are still in force.

We also understand that the Bandoeng (Java) quinine-works have made a contract to supply a fairly large parcel of quinine direct to Australia at the price of 1s 0½d per oz, "c.i.f." terms. It is stated that the world's total output of quinine in the bark amounts to 300,000 kilos., of which Java alone produces 250,000 kilos. four-fifths thereof being yielded by one province of Western Java alone. The planters in that province propose to form an association for the protection of their industry, and to issue a periodical to the members giving the fullest possible information on the subject.

Mr. H. A. van Overzee, of Amsterdam, sends us his annual review of the Amsterdam cinchona-market for 1897. He considers that, while the power of the combined German manufacturers has not been suffi-

cient to prevent an advance in the bark-price, owing to the increased consumption of quinine, yet their strength is by no means broken. The existing supply of cinchona is not excessive, but if the Java planters harvest and ship recklessly this year the advantage in price gained in 1897 will be lost soon; The results of the quinine manufacture in Java have been but slight up to the present. He considers that the Java planters alone have it in their power to regulate the price of quinine in the future, provided they can make a working-arrangement among themselves.

PRODUCE AND PLANING.

RAMIE CULTIVATION IN AUSTRALIA.—It is suggested that the rhea, or ramie, plant should be grown in Australia, where there is reason to believe that it will flourish, as it grows well in the Botanical Gardens at Melbourne and in nurseries elsewhere. Until recently the labour involved in separating the fibre from its gummy covering was so great that the crop could be grown commercially only where labour was very cheap, in Eastern countries. But the invention of a labour-saving process in 1895 brought the production and manufacture of rhea within the reach of other parts of the world suitable to its cultivating and bark-stripping, after a plantation has once been made, at £4 an acre, and the value of the bark at £10; but, of course, both expenses and returns must vary in different parts of the world.

TRAINING FOR BOTANICAL CURATORS.—The gardeners of Kew have a journal of their own, or, rather, of the guild they formed some years ago. A list of the names and addresses of members shows that no less than fifty-three old Kewites hold positions in India and the Colonies, whilst all the curators of Botanic Gardens in the United Kingdom were trained in the Royal Gardens. The limit of service for journeymen-gardeners is two years, but those who are promoted to sub-foremen stay on until they obtain appointments either in colonies and dependencies, or at home. Courses of lectures are provided after working hours on systematic, economic, and geographical botany, chemistry and physics, and certificates are granted. —*H. & C. Mail*, Jan. 28.

THE EFFECT OF EXCHANGE RATES ON INDIAN AND CEYLON TEA PRODUCTION—WHAT INDIA HAS BEEN SAVED FROM.

[To the Editor of *The Home and Colonial Mail.*]

SIR,—Sir James Westland is credited with stating that he has saved India from a fall in the rupee to an exchange value of 9d. Where is the saving? Is there a saving? Who makes the saving?

Had not the Indian Government taken to tinkering with the currency and maintaining the exchange value of the rupee at a fictitious level, as compared with its intrinsic worth it is probable that the proprietors of tea estates in India and Ceylon during the year 1897 would have reaped in profit some £2,000,000 more than they are likely to do.

The total imports of Indian and Ceylon teas into the United Kingdom during the calendar year of 1897 were 228,000,000lb, and the average price realised for same in London public auctions was roughly 8½d per pound. It is improbable that, taken over all, the profit on production exceeded 2d per lb, and, allowing another penny per pound for freight and charges not subject to exchange, we get 5½d per lb as the average local cost of production at the ports of shipment—Calcutta and Colombo. This cost has to be remitted in some m n er or other to India or Ceylon, and, on a yield of 228,000,000lb, we get £5,225,000 as the crop outlay for the year.

Taking the average rate of exchange for 1897 as 1s 3½d, and deducting from same the 9d admitted by Sir James Westland to be the present real value of the rupee, we have 6½d per rupee loss, or an aggregate loss during the year, of £2,190,000 to the tea industry from exchange alone. Roughly speaking, therefore, every penny up or down in exchange quotations means £340,000 less or more in net revenue from British-grown tea. The calculations have not been worked out to a nicety because the complete date of working them do not exist, but the result shown cannot be far from an actual one. Anyone, it affords grounds for "pointing a moral" against the maintenance on merely sentimental grounds of a fictitious level of value for the rupee, and the statement of such serious considerations may awaken the large body of proprietors and shareholders in Eastern tea estates to a realisation of the grave injustice that is being done to their interests. They have hitherto accepted the position in the belief that the upward movement in exchange was merely a spasm, and that we should probably soon see rates lower than ever; but the position must now be becoming serious for many proprietors, owing to the constantly falling prices on the one hand and the rising exchange on the other. The full force of both considerations has not yet been felt, but, as the accounts and reports for 1897 begin to be issued in a month or two, the effect is certain to be clearly shown in the rates of dividend, unless in the case of properties worked under exceptional circumstances.

There is no question but that the tea-producing industry, greatly benefitted by the more or less continuous fall in the exchange value of the rupee from its per level, and that consequently much new capital (in the way both of reorganisation of old concerns with a new proprietary at enhanced values, and in direct opening up of new properties) has been put into the business in the last few years. Many of such investments were made on calculations which had for their basis the understanding that a rupee did, as the China dollar does, represent its silver value; but the financial advisers of the Government of India have given a rude shock to those who have placed their trust in that idea.

The amount of capital invested in tea estates in India and Ceylon is somewhere near £40,000,000, and it will be apparent that those who hold the investments are being taxed to maintain a high rate of exchange to the extent of something like 5 per cent. per annum on the capital value of their holdings.

—I am, sir, yours, &c., JOHN MCEWAN.

—*H. & C. Mail*, Jan. 28.

NEW MINOR PRODUCT FOR CEYLON: THE CAMPHOR TREE.

"It is reported that three well-known citizens of Orlando, Florida are going to plant about 60 acres with camphor trees." So runs a paragraph in an English journal; but why should it not be one, two or three planters in Ceylon? If the camphor tree is expected to flourish in Florida, much more should it succeed in Ceylon and we know something of the conditions on both countries. Undoubtedly there has been a stir in the camphor trade lately; and between the 25th December and 15th January there was a rise in the price of crude camphor in the English market of from 4s to 8s 6d per cwt. But this may be a temporary movement due to interference on the part of the Japanese with the Formosan camphor trade. This is likely to be rectified, since we read that,—

The Japanese are now showing, that while they are determined to get a good grip of the Formosan camphor-trade, they are to gang warily about it, and those who know the Japanese agree that when they have the Formosan trade in their own hands, they will conserve rather than restrict the output of camphor, and by introducing their own method of distilling, they will get more out of the wood and put a better quality of crude Formosan camphor on the market. It will be remembered that the exports of camphor from Formosa have increased enormously during the past ten years. In 1886 the output was

1,335 piculs, and in 1894 no less than 39,547 piculs were exported. Some falling-off resulted in consequence of the war and the Formosan rebellion in 1896 but we observe that the Tainan export in 1896 amounted to 8,007 cwt., or 641 cwt. above the average for 1891-94, so that improvement had set in; and we may fairly say that the same holds good for the northern territory, which produces a much larger proportion of camphor. The London importations of camphor in 1897 confirm this view, 1,050 packages (approximately 1,837 cwt.) more being received than in 1896, but there is still a good leeway to make up before we reach the figures obtaining before the war, as the following shows:—

	1894	1895	1896	1897	
Imports ...	11,081	19 711	6,473	7,523	packages
Deliveries..	11,663	7,923	10,814	8,017	,,

These figures represent Japanese and Chinese camphor. It is obvious that the imports at the present time are less than the demand, and we have during the past two years drawn upon the reserve stock held in London (fully a year's supply). In view of these facts refiners' reduction of price is an indication of their confidence in the future of the article. The Tainan Consul supplies an excellent corollary to this in his statement of the cost of crude camphor in first-hands at Formosa. It will be seen that the lowest cost was $13 per picul, or about 33s 6d per cwt., taking the dollar value at 2s 6d. The product doubled in value ($37 per picul) by the time it reached Hongkong, and the simultaneous price in London was 87s 6d cwt. As the market stands now, we have again reached the minimum, and while an increase is to be expected during the year, we do not think, that the extravagant prices of the past few years can rule in the face of an improving supply and the disaster which attended speculation in recent years.

There is encouragement in all this, to cultivate and as we said above, Ceylon planters might well give a trial:—

Cultivation.—The plant should succeed in most parts of the island. It may be propagated from cuttings or raised from seed in a bed set apart for the purpose. When ready for planting out, plant in rows 8 feet apart, giving a space of 4 or 5 feet between each plant.

Preparation.—In a letter to the Royal Gardens, Kew, Dr. A. Henry gives the following description, obtained from the Rev. E. Y. Gilman, of the process employed by the Chinese in extracting the camphor from the plant in the Island of Hainan:—The plant is in flower in July and August. During the fall and winter months the Chinese of the island, or the aboriginal Lois in Chinese employ, collect the young leaves of the plant, which there grows to a height of 8 or 10 feet. They say they only take the last three joints of the branch. The leaves are allowed to remain on the branch, and are wilted for a couple of days. They are then placed in the retrot, which is a cask about 2 feet high, open at both ends, and of a diameter suitable to place it over a large Chinese frying-pan (say the diameter is 20 inches). The frying-pan is filled with water, and over the water is placed a coarse sieve of woven bamboo to separate the leaves from the water. The cask is cemented with clay to the edge of the pan, and after receiving its charge of 30 lb. or 40 lb. of the leaves, a large brass basin is placed on the upper open end of the cask, and is filled with cold water which is frequently changed. Fire is placed under the frying pan, and the process of distillation is continued for about four hours. At the end of that time the brass pan is lifted off, and its lower surface is found to be coated with a layer of crystallised substance about sixteenth of an inch thick. This is the *ai fen* or crude camphor, and is sent to Canton, and remanufactured into *ai-p'ien* or refined camphor.

Another writer gives the following as the process of preparation:—(1) A large pan or cauldron is filled with water, and a tin or can without a lid is set upright in it. This tin has a small aperture beneath, into which is fitted a metal tube. The plant is put into the tin, and a second iron pan put over the tin like a cap. This pan has an aperture through which issues the tube leading from the can. The water is made to boil, and the steam, having no other means of egress but the tube, passes through the can and out of the covering iron pan, steaming the plant on its way, and condensing as "*ai* dew." (2) In the second place, the "*ai* dew" is put into a tin or can which has no orifice in it, and, with that variation, treated as before. The product is called *ai fen* (or "*ai* flour" or "powder"). (3) The "*ai* powder" is treated according to the first of the three processes, and the essence thus distilled is the fragrant *ai yu* or "*ai* oil."

Notwithstanding the comparatively narrow limits of its natural environment, the camphor tree grows well in cultivation under widely different conditions. It has become abundantly naturalised in Madagascar. It flourishes at Buenos Ayres. It thrives in Egypt, in the Canary Islands, in South Eastern France, and in the San Joaquin valley in California, where the summers are hot and dry. Large trees at least two hundred years old are growing in the temple courts at Tokyo, where they are subject to a winter of seventy to eighty nights of frost, with an occasional minimum temperature as low as 12° to 16° F. The conditions for really successful cultivation appear to be a minimum winter temperature not below 20° F., 50 inches or more of rain during the warm growing season, and abundance of plant food rich in nitrogen. In the native forests in Formosa, Fukien, and Japan, camphor is distilled almost exclusively from the wood of trunks, roots, and larger branches.

The work is performed by hand labour, and the methods employed seem rather crude. The camphor trees are felled and the trunk, larger limbs, and sometimes the roots, are cut into chips which are placed in a wooden tub about 40 inches high and 20 inches in diameter at the base, tapering towards the top like an old-fashioned churn. The tub has a tight fitting cover which may be removed to put in the chips. A bamboo tube extends from near the top of the tub into the condenser. This consists of two wooden tubs of different sizes, the larger one right side up, kept about two-thirds full of water from a continuous stream which runs out of a hold in one side. The smaller one is inserted with its edges below the water, forming an air-tight chamber. This air chamber is kept cool by the water falling on the top and running down over the sides. The upper part of the air chamber is sometimes filled with clean rice straw, on which the camphor crystallises, while oil drips down and collects on the surface of the water. In some cases the camphor and oil allowed to collect together on the surface of the water and are afterwards separated by filteration through rice straw or by pressure. About twelve hours are required for distilling a tubful by this method. Then the chips are removed and dried for use in the furnace, and a new charge is put in. At the same time the camphor and oil are removed from the condenser. By this method 20 to 40 pounds of chips are required for one pound of crude camphor.

Remembering that some years ago, Mr. Nock of Hakgala advocated the planting of camphor, we enquired as to what had been done so far as he knew. Here is his very satisfactory answer:—"With reference to your question about camphor, I may state that during the year 1895 we sent out from the garden 975 plants to 37 applicants. These were planted in a great variety of elevations and climates and I believe they are doing well in nearly every place. Some that were planted near Galle had grown in two years to a height of 12 feet, others at Nuwara Eliya have grown to nearly that height, and some here at Hakgala are now over 9 feet high. This growth is very satisfactory. The plants coppice well and as solid camphor can now be extracted from the leaves, camphor is a plant, in my opinion well-worth planting as a minor product. It is also a very ornamental tree. Not having had an oppor-

tunity of seeing the plants growing in the different localities, in the lowcountry (I wish I had) I am really not able to state, with any certainty, what locality will be likely to suit them best, but so far as I can judge at present they seem to be not at all particular, provided they have fairly good soil. Of course elevation, and a dry or wet climate may affect the yield of camphor oil and solid camphor. This can only be determined by actual experiment."

IMMIGRANT COOLY ROUTES.

THE PROPOSED DEPOT: HARE ISLAND VS. TATAPARAI.

THE SUB-COMMITTEE'S REPORT TO THE P. A.

COOLY ROUTES: TUTICORIN-COLOMBO.

At the present time the coolies find their way to Tuticorin by rail from the various stations on the South Indian Railway, and remain in that town for generally a day or so before embarking for Colombo. The place of embarkation is the jetty, which juts out from the open space along the sea-front of the town, and up to which a line of rails is carried connecting with the railway, so that trains can be brought straight up to the jetty. The usual hour of embarkation is about 4 o'clock p.m., and passengers are taken out to the ship in a steam launch, a distance of about five miles. Coolies staying at Tuticorin are subjected to risk of blackmailing as well as infection of cholera and other diseases. It therefore becomes necessary to organize some plan by which the coolies need not or cannot go into the town at all. Two places have been suggested, viz., a depôt either at Hare Island or at Tataparai.

Hare Island lies on the course of the steam launches running between the steamers and the jetty, and is about one-hundred and twelve acres in extent. The Tuticorin light-house is situated on the island, which is otherwise uninhabited. Tataparai is the first Railway Station from Tuticorin on the S. I. Railway, and is about nine and half miles from that town. In considering the advantages and disadvantages of the two schemes, the points calling for attention are:—

1. The expense.
2. The convenience, accessibility and hygiene.
3. The risk of infection.
4. The comfort of the coolies.
5. The attitude of the Government.
6. The possibility of this route becoming less used.
7. The existence of a depot and possible quarantine station at Ragama.
8. The arrangements for remitting funds to coolies in transit.

1. THE EXPENSE.—The cost of the scheme at Tataparai is estimated at about R7,000, including all necessary buildings to accommodate, say, 1,000 coolies. It must be understood that it is not proposed to make either place into a quarantine station, but only a stopping place when the coolies can rest and cook their food after the railway journey. The cost of the Hare Island Scheme would have to include a jetty on the island besides quarters for the Immigration Agent, and could hardly amount to less than four or five times the cost of the Tataparai Scheme.

2. THE CONVENIENCE, ACCESSIBILITY AND HYGIENE.—If the Tataparai Scheme be carried out, coolies can be booked from stations on the railway to Tataparai and detained there, and can again be booked through from Tataparai to Colombo, or any station on the C. G. Railway. Kanganies wishing to keep their coolies out of Tuticorin can therefore do so by through booking from Tataparai. Coolies will not be subjected to blackmailing by Tuticorin caddy-keepers or others, as the depot being on premises belonging to the railway, no persons will be admitted unless with the permission of the Agent. No caddies can be erected in the neighbourhood as the railway has a right to prevent any buildings being erected within a radius of half-a-mile from the station, and this right will be exercised.

As regards the Hygiene, the Ceylon Assistant Immigration and Medical Officer, Dr. Bawa, has reported that the soil at Tataparai contains organic matter, and is likely to become sodden and waterlogged during the rains but that by drainage, paving, and conservancy, this objection can be obviated. It appears, however, that the total rainfall for 11 months last year was only 21 inches, and that not more than 5 inches fell in any one month.

As regards Hare Island, in order to get there, the coolies would have to go first to Tuticorin, and would be liable while there to all the disabilities if the present system; unless they had booked through to Colombo or could be induced to go straight off to Hare Island. This they could not be compelled to do, and it would also be impossible to prevent residents of Tuticorin from visiting the Island unless the Madras Government took steps to prohibit any visitors. As regards Hygiene, Hare Island would be a healthy place, and the depôt could easily be kept in a sanitary condition by the use of sea water which would be carried by the coolies. Fresh water can be supplied to either depot in any quantities required by means of tanks on the rail or by boat at a nominal cost. Should cholera break out in anything but a sporadic form at either depot, the result would probably be that the depots would have to be closed temporarily. The coolies would not remain at Hare Island if cholera prevailed there, and it is doubtful if the light-keepers even would stay, and as regards Tataparai, it would not be right to receive more coolies into an infected depot. But with efficient supervision it is improbable that any serious outbreak would occur at either place, as each case would be immediately segregated. It should not be forgotten in considering the necessity of an expensive scheme that but little trouble has been experienced hitherto as regards cholera amongst immigrant coolies, and that the immigration of this class by this route has only once been interrupted in recent years.

It has been suggested that in case of interruption of traffic between Tuticorin and Colombo, coolies might still be shipped from Tuticorin to Paumben, and quarantined at the station, and the flow of coolies to the Island thus maintained until the Colombo route was reopened.

3. The risk of infection of immigrants would be much less if either scheme were adopted, than it is at present. At Tataparai the only risk would be from coolies who had the infection on them, and at Hare Island the same remark would apply, provided the coolies could be induced to go there without stopping at Tuticorin on the way.

4. The comfort of the coolies could be equally provided for at both places. As far as buildings are concerned—but in stormy weather the coolies on Hare Island would be exposed to the full force of the wind and spray or drift sand—besides being exposed to the unavoidable discomfort of a double transhipment.

5. The attitude of the Madras Government is unfavourable to the Hare Island Scheme. We are informed on the best authority that that Government have no objection to the Tataparai depot scheme on the lines laid down in Mr. Wilkinson's letter of 1st November, 1897. The coolies being a free immigrant no compulsion of any sort will be permitted, and he must be perfectly free to come and go. It will, therefore be impossible to prevent him from visiting Tuticorin if he chooses, even after he has been conveyed to Hare Island, and also it may be supposed that the Madras Government will not sanction any prohibition of Tuticorin residents visiting the Island. If o, this of itself would almost be enough to condemn the Hare Island Scheme. Whereas by the Tatapa·ai scheme the avoidance altogether of Tuticorin would be likely to work automatically.

6. The possibility of this route becoming less used must be taken into consideration in view of the statement by the Governor of Madras when on tour lately inreply to the address from the Municipal Council of Madura. He said he was convinced of the advisability of the project of a line from Madura to Paumben, and the certainty of its remunerativeness, and the Supreme Government has now recognised the expediency of the line being constructed. It follows that this line will probably be sanctioned in the near future, and the time for completion is estimated by the Railway authoritie at about two years after sanction has been received. This line in conjunction with the North Road and the Northern Railway and the steamer service from Paumben to Colombo would undoubtedly divert a large amount of cooly traffic from Tuticorin. Expert opinion has been given that steamers can be laid alongside the jetty at Paumben, and coolies can walk on board, a great advantage over embarkation by launch or lighter. By the Madura-Paumban railway an alternative route will be available in the event of cholera closing the Tuticorin route, and the coolie will have the option of continuing his journey by sea to Colombo, or by the northern land route according to his destination.

6. By these means also should the port at Colombo be temporarily closed, the influx of coolies whether from Tuticorin or Madura could still go on via Paumben and Mannar.

7. THE EXISTENCE OF A DEPOT AND POSSIBLE QUARANTINE STATION AT RAGAMA.—As this station has been established and is now in use, and will not be discontinued so long as the Colombo route is open for coolies, it seems unnecessary to go to the expense of a quarantine station on the Indian side, and it is doubtful whether quarantine could be established on that side or whether such quarantine would be accepted as sufficient on this side. Coolies could not be expected to place themselves voluntarily in a quarantine station at Tuticorin. Neither Tataparai nor Hare Island intended to be a quarantine station, but only depots and resting places. Is it therefore necessary to go to the expense of the Hare Island scheme for a depot merely?

THE ARRANGEMENTS FOR REMITTING FUNDS TO COOLIES IN TRANSIT.—The Sub-Committee consider that owing to the position of Tataparai on the railway and telegraph line, it will be easier for the bankers at Tuticorin to provide banking facilities at that depot than at Hare Island.

In fine the Sub-Committee approve of the Tataparai scheme, and prefer it to the Hare Island scheme, not only on the score of expense, which (were Tuticorin the only probable and permanently popular route) would not be an unsuperable objection, but because on the whole the former scheme seems to meet the necessities of the case by being more likely to accomplish the object in view—which is to promote immigration by preserving the cooly from interference and tampering at Tuticorin, and from risk of infection, whilst at the same time falling in with the views of the Madras Government.

The Sub-Committee hope to report later on upon the Northern route after visiting Paumben—but meanwhile would point out that in their opinion now that the railway has been sanctioned to Anuradhapura, that route should be made as convenient and popular as possible, and at the same time nothing should be done to compel the coolie to use that route or to interfere with his freedom of choice if he prefer the sea route.

The Sub-Committee recommended that an European Assistant Immigration Agent be appointed at Tuticorin to inaugurate the depot, and make arrangements for facilitating money transactions between planter and kangany.

Further as a result of their personal inspection the Sub-Committee make the following recommendations :—

RECOMMENDATIONS.

I. That two K. S.* type steamers with bilge-keels be run.

II. That better bulwarks and shelter be provided for both launches and steamers.

III. That large placards in Tamil be posted at the jetty, coolies depot and railway stations warning coolies not to pay anything more than the actual cost of their ticket, and to report any cases of attempted blackmailing to the Agent on the spot. To facilitate identification the launch boatmen should be numbered.

IV. Inasmuch as the Tataparai scheme is an experiment, the Committee recommend that Government be requested to obtain the consent of the Madras Government to the continuance of the arrangement indicated in paragraph four of the letter dated 26th July, 1897, from the Government of Madras to the Government of Ceylon, (whereby the Collector of Tinnevelly has been directed not to make to private parties any further assignments of land on Hare Island) so as to allow an opportunity (if necessary) of reconsidering the Hare Island scheme.

(Signed) J. N. CAMPBELL,
,, JAMES RYAN,
,, A. PHILIP,
Secretary.

A SEPARATE REPORT BY MR. HARCOURT SKRINE.

In dissenting from the views of the three members of Committee who have signed the report, I am aware that my own views of the necessities of the Immigration question go a good deal further than what the Government appears to think necessary, and are perhaps tinged by my recollections of three years spent at Tuticorin during a period when cholera was unusually prevalent, and when I am satisfied that a Tataparai establishment would have had to be abandoned.

I also cannot disconnect from my mind the further question, in which the whole island of Ceylon is interested, of the requirement, ultimately, of some guarantee for the health-bill of the Colombo Port if the Coolie Route is to be

* The K. S. type is similar to the "Katoria."

permanently kept open. It is because a Hare Island Depot will alone serve these objects that support it as against the Tataparai proposal, and seeing, that the success of tea depends on the free supply of cheap labour, cheaply financed, it behoves Planters to consider, when two schemes are presented to the Association,—which of the two will best serve their ends.

As the Committee's Report favours a depot at Tataparai, I propose detailing (1) a working scheme for a Hare Island depot; (2) the difficulties that would have to be overcome to make it practicable.

(3.) The drawbacks, as they appear to me, to the Tataparai scheme.

(4.) To compare the two schemes as regards (*a*) isolation and crimps: (*b*) hygiene; (*c*) outbreak of cholera; (*d*) closing of the route; (*e*) Ragama.

(1.) Were it decided to utilise Hare Island as a depot, and sanitary station for immigrant coolies (I purposely avoid the word Quarantine as the application of this can only be arrived at by mutual arrangement between the Governments of India and Ceylon), the system, I would recommend, would be this.

Kanganies taking gang tickets at stations in India would book direct to Hare Island. They should reach the terminus at the Export Jetty on the Tuticorin Beach Road (which is separated from the native town by a line of merchant offices) at about 12 noon. The British India agents, who control the whole of the well-disciplined lighter service, would have the requisite number of sailing boats waiting to receive the coolies at the jetty, and after the usual medical inspection parade, they would at once embark for the Island.

The voyage usually takes half an hour, and is so reliable as regards a favourable breeze in either monsoon that rowing boats are unknown in Tuticorin, and shipping charges to the steamers lying 6 miles out are actually lower than in Colombo, where manual labor at the oar is necessary.

The coolies should arrive at a jetty on Hare Island at 1 p.m., and the same boats should proceed to take on the coolies who had been resting from the previous day to the steamer.

Establishment.—The first requirement would be the erection of a jetty. The Committee who visited the Island were of opinion that a jetty 100 yards in length, might be necessary, and the cost of such a jetty is given by the Southern India Railway Company from their own experience at Negapatam at R8,000. I am of opinion, however, that if the coral required for building the depot were raised from the sea in this locality a jetty of forty yards long enough for boats to lie up against would be sufficient.

The following buildings would be needed for the depot.

Cooly Lines.—If as at Tataparai, R7,000·00. It is in my opinion probable that the cost of building will be much the same at Hare Island as at Tataparai, as coral can be raised by hand with little effort, and provides material for permanent buildings as well as lime, sand also being available in any quantity for cement. At Tataparai the buildings would be of mud and plaster costing probably as much, and not permanent. Roofing would be same in either case, either iron or cadjan, the latter very inexpensive, and generally in use throughout the native town of Tuticorin.

Space could be reserved for agent and banker's houses and gardens; quarters for medical staff and a Police Station.

Labor being cheap, and the material with exception of cement, timber, and roofing free, the whole complete cost of buildings should not exceed R19,200, divided thus:—

Cost of Jetty	.. ..	R3,200
Houses for Agent, Banker and Police station		9,000
Cooly Lines as per Tataparai estimate		7,000
	Total	R19.200

In comparing this estimate with the R7,000 allowed by the Committee for Tataparai, it must be remembered that the latter scheme assumes that the Agent and Medical Staff would reside in Tuticorin. Ground rents are high in Tuticorin, a moderate-sized house letting at R100 and R150 per month. In point of expense, therefore, there appears to me to be little to choose between the two schemes.

Hare Island as a Depot.—Coolies on landing at Hare Island would pass on to the lines appointed for them by the medical authorities, where they would feed and rest, have their clothes disinfected, and, probably. On their own account, bathe in the sea, on the following morning they would proceed to the Bank offices to shew their cheques and letters, and assuming estates to have opened, and account with the Bank, these would be debited with the necessary disbursements. The coolies having had a good mid-day meal, would proceed at 2 p.m. to the steamer one and half miles off.

2. The Difficulties to be overcome to make the Hare Island Scheme Practicable are these.—(*a.*) To obtain a lease of the island from the Madras Government. (*b.*) To get the Madras Government to police it (*c*) To secure Bankers. (*d.*) Importation of water, food supplies and fuel. (*e.*) Exposure to weather,

(*a*). The Committee were assured by the correspondence of the two Governments placed at their disposal that the Madras Government was wishful to assist Ceylon should it desire to establish a cooly depot on the island, and the sub-Collector assured them that matters were so arranged as to provide for a lease being given of the whole 112 acres with the exception of 7 acres reserved for the light-house.

(*b.*) The policing of the island would appear to be a natural office of the Madras Government.

(*c.*) An Indian Bank has already been in correspondence with the sub-Committee on this subject, and the Tuticorin officials appear to think a scheme in every way feasible.

(*d.*) The cost of *water* is ascertained to be ½ cent per cooly at ½ gallon a day, if the best imported water is used.

Food Supplies.—As until lately rice and curry stuffs were mainly imported into Tuticorin by sea, there should be much difference between the cost of these on the Island and at Tuticorin, and with the cheap boat-hire, the difference, if any, would be immaterial.

(*e.*) Exposure to Weather on the Island.—This is an objection that I cannot concur with the Committee in admitting. The force of the S.-W. Monsoon is broken at Hare Island just at Tuticorin by the Cape Comorin Mountains, and can at no time be compared to the monsoon burst on the Ceylon coast. Yet cooly lines might be erected, without objection on this score (within 100 yards of the surf line) anywhere between Colombo and Mt. Lavinia.

Drawbacks to Tataparai.—(*a.*) An objection to Hare Island that coolies would not go there, but stay at Tuticorin appears to me to apply equally to Tataparai. No doubt, at first

a few kanganies might preter to go to their accustomed hunts, but even these would soon recognise the advantages of the depot. It is an objection that may in my opinion be ignored in each sase.

(*b.*) AS A RESIDENCE FOR IMMIGRATION AGENT AND MEDICAL STAFF OR BANKERS.—The fact that the report of the Committee supposes these officials to travel backwards and forwards from Tuticorin every day indicates that they would agree with me that this wayside station in a sun-baked desert, where the houses would be closely packed amongst a crowd of cooly lines, would not be acceptable for European residence. Assuming a Finance scheme to form part of the work, it is difficult to see how a banker travelling up and down with the silver necessary for the business would get through his work at all when 1,000 to 2,000 coolies were travelling during the limited time at his disposal.

(*c*) A special train would be required to take off the coolies for embarkation. This is an additional expense which must be paid for directly or indirectly. In the Hare Island proposal the ordinary train is sufficient.

(*d*) The coolies from Tuticorin would have to take their meals (previous to embarkation) at least two hours earlier than from Hare Island. As coolies do not feed on boardship, this is a point of importance.

COMPARISON OF TUTICORIN AND HARE ISLAND. —As regards (*a*) issolation and crimps ; (*b*) hygene ; (*c*) outbreak of cholera ; (*d*) closing of the route ; (*e*) Ragama.

(*a.*) It is urged against the Hare Island Scheme that the Madras Government will permit no compulsion either in the matter of preventing natives other than immigrant coolies from landing at Hare Island or in preventing the coolies from visiting the mainland.

With regard to crimps it must be noted that these are said by Capt. Baker the Port Officer of Tuticorin, to be carefullyexcluded from the embarkation jetty there, so that the same practice miget be adopted at the Hare Island jetty. Crimps would, therefore, have to land on their own account in small boats, and would find difficult to pursuade coolies who were well fed and resting from a journey to take a four and half mile voyage back to the shore while any resort to ill-treatment of the Kangan, or coolies which is the method so successfully in the Tuticorin bazaars, would be dealt with by the police under the immediate eye of the resident agent. The crimp would have no right in the lines, and would have to return at night to Tuticorin.

TATAPARAI.—When so much stress is laid on the inability of the Madras Government to exercise any interference in respect to an island separated by 4½ miles of sea from the mainland, it is as well to study the question of isolation at Tataparai. In this head Dr. Bawa states in Clause 7 of his report to the Ceylon Governme nt. "The chosen site cannot be looked eaupon as an isolated one, situated, as it is, with a large village population within a short distance of it." It is also the first station on the rails way 'out of Tuticorin. I see nothing to prevent the crimp from travelling by the same train as the agent, Banker and coolies returning from Ceylon and alighting at Tataparai to do his business, or, he can make Muniachi—the junction station of the Tinnevelly and main lines his head tquarters and travel down with the coolies from Madura. At night he can take them off into the villages referred to by Dr. Bawa.

(*b.*) HYGIENE.—Under this most important head the two schemes can be best compared by quoting Dr. Bawa's report, Clause 8, on Tataparai.

"As to its sanitary aspects I am of opinion that the heavy black Cotton soil containing much organic matter and boggy, and sodden during the rains, would be an undesirable situation for the collection of a large number of uncleanly human beings. A situation with a poor sandy soil would be preferable." The first is a discription of Tataparai, the second of Hare Island.

WATER SUPPLY at Tataparai—though as a rule sufficient for drinking purposes, would, I should say, be quite inadequate for the ablution of the coolies, much less for the washing out of the lines. The advantages of Hare Island in this respect are too obvious to be worth going into.

(*c.*) OUTBREAK OF CHOLERA.—This expression appears to me misleading. It is well-known that cholera in an epidemic form is unknown in Southern India, but that, in times of famine as in 1876-7 epidemic cholera, arising from vitiated water, is so rife as to incur the name of "general outbreak." At such a time a certain percentage of coolies arriving either at Tataparai or Hare Island may be expected to develop disease contracted before they left their homes. Tataparai, described as it is by Dr. Bawa with its organic soil, limited area and surrounding village population, would not appear to be favourably situated for coping with such a contingency. On the other hand the pure air, the facilities for washing out and disinfecting lines coolies and clothing render Hare Island an ideal situation, while its area twenty times that of Tataparai would admit of any number of coolies remaining under medical supervision till the period of incubation was over. The immediate segration of any chance cases that might so occur should be considered sufficient to practically protect Colombo from all risk of infection even without quarantine rules. Steamer agents would, of course, only issue tickets to coolies going to Colombo who had satisfied the medical authorities at Hare Island.

CLOSING OF THE ROUTE.—It must be remembered that if this route were closed the circumstances at Paumben, where the water is notoriously bad, would be no better and the general danger to our labour communication is impossible to over-estimate. In this respect Tataparai supplies a new danger to the route inasmuch as any general alarm of cholera there may induce the Tuticorin Municipality to bar arrivals from that place. At present it lies with the Ceylon Government to close the route which it is loth to do owing to the exigencies of the tea industry. I cannot therefore regard the Tataparai scheme as likely to be of service except during the existence of favourable conditions.

RAGAMA.—This depôt has never been tested by cholera. In my opinion a depot at Hare Island would make Ragama quite unnecessary.

HARCOURT SKRINE.

TEA PLANTATION COMPANIES, LIMITED, IN RUPEE CURRENCY.—This compilation as a Supplement to that of Messrs. Gow, Wilson & Stanton of sterling Companies, has just left the printer's hands. It includes altogether some 50 Rupee Companies and about 120 Estates belonging to such Companies. An index for each is given, so that not only each Company, but each estate can at once be referred to. The volume should be very useful to brokers, bankers, merchants, and all dealers in tea shares.

Correspondence

To the Editor.

CEYLON TEA IN RUSSIA.

Moscow, 5/17th Dec. 1897.

A. PHILIP, Esq., Secretary to the "Thirty Committee," Kandy, Ceylon.

DEAR SIR,—I confirm my letter of the 21st August, 2nd September. Having been since, a great deal absent from Moscow and expecting at any moment the visit of Mr. Christie, I refrained of writing sooner. I had, last week, the pleasure of seeing here Mr. Christie, and while I will leave it to that gentleman to express his own opinion about myself, my business and my work, past and future, as regards the interests of "Ceylon" and "Ceylon Tea" in this country. I will refute the hostile "Editorials" which have lately appeared in the columns of the "Times of Ceylon," by stating:—

1st. That my Company has been floated with the object of continuing to push the sale of "Ceylon Tea," as well as trying to introduce Indian tea, in Russia.

2nd. That the business I have been carrying on in Russia will be materially improved by the increased capital that has been put into it, and that I will be enabled thereby to increase the outlet for Ceylon tea in this country in a way that I have not hitherto succeeded in doing, so largely as I would have wished.

3rd. That none of the Ceylon money has been used by me for advertising Indian tea, and that it has never been my intention of doing so.

4th. That in the beginning of November last. before leaving London, I have acquainted Mr. Wm. Martin Leake of the fact that my Company had been successfully floated.

It remains now for Mr. Christie to report upon the progress of Ceylon tea has made in Russia and to suggesst the plans of action to be adopted in future for further extension. Enclosing copy of my today's letter* to the Editor of the "Times of Ceylon."—I am, dear sir, yours faithfully,

(Signed) M. ROGIVUE.

* The letter referred to is as follows:—

Moscow, 5/17th Dec. 1897.

Sir,—In your issue No. 46 of 18th November, 1897, I read your two editorials, "Rogivue, Limited" and "Mr. Rogivue and the Thirty Committee" which I find ather offensive, both for myself and the promoters of my Company.

While contesting (*sic*) yourself the right to blame my action, I beg to state:—(1st) That I am not and have never been a paid servant of the "Thirty Committee." I spent the money they have sent me, and a great deal of my own, in advertising "Ceylon Tea" in Russia, without any compensation whatever for my work, my travelling expenses or other charges, but the only benefit my business has gained by the "advertising." I, therefore, think that I was quite at liberty to transfer my business to a Company, without asking the permission of the "Thirty Committee" or anybody else. (2nd) My Company has not been floated to push in Russia the sale of Indian Tea *only*. (3rd) I deny that I have been 'crimped" by anyone.

I shall thank you to publish this letter in one of your next issues, and remain, dear sir, yours faithfully,

M. ROGIVUE.

CEYLON TEA IN CANADA AND UNITED STATES: GOOD NEWS.

Toronto, Dec. 14th 1897.

DEAR SIR.—You will be glad to hear that our Government has placed restrictions on the importation into this country, of adulterated and low grade teas which have been refused admittance into the United States. Practically, this will not affect Ceylon and Indian Tea at all, but it will be a very serious blow indeed to China and Japan, because of the large amount of adulteration and coloring matter used in their teas.

We feel confident that it will prevent *at least* a million pounds of low-grade China and Japan Teas, coming into Canada annually, that have hitherto come in, and give us a chance to supply the people with our pure teas.

We might say that the action of our Government was chiefly brought about by the work of your Commissioner. Mr. McKenzie, and the Indian Commissioner, Mr. Blechynden. The series of articles that appeared in the American papers, on the refusal at American ports of large quantities of China and Japan teas, attracted the attention of our Government, or was rather brought to their attention by ourselves; hence their action. The insertion of these articles in the American papers was wholly due to Mr. McKenzie and Mr. Blechynden: they have accomplished a very great deal indeed, and we feel very grateful.—We are, yours truly,

P. C. LARKIN & Co.,

P. S.—We shipped a cart-load of twenty thousand pounds of tea to Boston, on the 8th. We can report splendid business prospects in the United States.

CEYLON TEA IN NORTH AMERICA.

Hampstead, N.W., Jan. 6.

DEAR SIR,—I enclose lists of tea packets being advertised in Canada, also orders sent to tea inspectors, on the subject of tea rejected in U.S. and trying to get into Canada.

Orders from "other" countries, chiefly Russia and America, are keeping up prices of low grades, which these countries chiefly take. The large blending houses here, cannot get those teas at their own prices; but to be averaged, they bid less for medium teas, and *foreign orders* do not defeat their combination. They divide breaks, instead of competing for them.

The shares of the recently formed Companies such as "Mazzawattic," are rising in consequence of the immense profits our cheap teas brought them in 1897. It is almost time a "Grower's Distribution Co." was formed.—Yours faithfully, WM. MACKENZIE.

[We cannot fully reproduce the enclosures; but they are referred to elsewhere.—ED. *T.A.*]

THE YIELD OF RAMIE PER ACRE.

39, Victoria Street, Westminster, S.W. Jan. 14.

SIR,—Instead of entering into a wordy discussion with your good self, and the various correspondents who doubted my figures as to the yield per acre of Ramie stems in the Straits, I put myself into communication with Mr. Tom Gibson of Klang, Selangor, the Hon. Secretary of the United Planters' Association, who for some time past has been experimenting with Ramie for his Association, and asked him for his candid opinion as to whether my estimate of 70 ton

per acre was an excessive one. I enclose you a copy of his reply; but at the same time, as I have always said, I wish it clearly to be understood, that, these figures may not apply to Ceylon—if the Ceylon Planters wish to know what the yield per acre is, they will have to plant up one and test the results.

Correspondent D, in your issue of the 1st November last asks, how I account for the variation between the yield in Australia, and that in the Straits. My answer is, that in consequence of the dryness of the Australian climate, the weight of the stems would be much less there, than in the humid climate of the Straits, where they contain 80 per cent of water. From experiments in Kwala Lumpor, it was found that the actual yield of cleaned filasse, was 2½ per cent. I assume that 4 per cent would not be excessive for a dry climate—we get 3 per cent in Algeria—the stems all contain the same amount of fibre; but the yield depends upon the quantity of water they contain.

As to his second question, let us see what Ceylon can produce. We will then consider how far we can meet the Planters on the question of machinery. I, however, repeat my advice: go slow; wait the result of our estate at Johore; and in the meantime test the capabilities of your land and climate.—Yours truly,

J. M. MACDONALD.

Sungei Puloh, Klang, Dec, 14th, 1897.

Messrs. MacDonald, Boyle & Co., 39, Victoria Street, Westminster, London.

DEAR SIR,—In reply to your inquiry, I may state that in my opinion your estimate of 70 tons of stems per acre is well within the mark given soil such as I have experimented on and from my personal knowledge the soil and climate of Muar where you have got a large concession of land is very similar to the soil here. I would go further and state that I consider more than 70 tons can be got, judging from results I have got since you were here—in fact the growth was so marvellous that I published the facts in our local paper and send you a copy per same mail. In addition to what I have there stated I may tell you that *each* of the *unrooted cuttings* planted on the 5th October last had six stems, four of which are now almost ready for cutting, and I yesterday exhibited an average stem at a Committee meeting of the United Planters Association, of which I am Secretary, and it was 5 feet 4 inches long. Further, from calculations I have carefully made and based on actual results I find that given *one acre of Ramie* say four months old, you can plant up *1,000* acres in *12* months. Please note that I am only counting on cuttings from the *original* acre and make no allowance for cuttings from the first and second series of plantings.

I consider you are exceedingly fortunate in getting, such a valuable concession of land at Muar and it may interest you to hear that $5 per acre has been offered for a large area on the opposite side of the river to your concession.

As you know from experience planters want a lot of convincing before you can get them to take up a new product, and possibly you may have been disappointed that a greater interest was not taken in the matter after the demonstration you have in Kwala Lumpor, and which, in my opinion was a success, but I may tell you that I can clearly see that a decided interest *is* being taken and I am confident that all those who have land suitable for the product will go in for it more or less.

In Selangor we have thousands of acres of alluvial land suitable for Ramie cultivation and there is also a large area in Perak. Muar Valley has also thousands of acres of similar land and it is bound to go up in value. I believe there is a great future for Ramie in the Straits and the Malay States, in fact we seem to have exactly the climate required for the cultivation.

Let us produce the stems and you can do the rest and there will be no cause to grumble.—Wishing you every success, I remain, dear sir, yours faithfully,

(Signed) TOM GIBSON.

(*Extract from the "Malay Mail," Dec. 9th, referred to above*) *Ramie Cultivation.*

To the Editor of the "Malay Mail."

Dear Sir,—Your planter readers may be interested in the following facts as to the growth of Ramie in alluvial Klang land:—

1. Several clumps of Ramie, having an average of 20 stems each were cut down to within three inches of the ground on the 16th November last and the stools today (21 days from cutting) have an average of 40 stems, three feet to three and a half feet long and nearly half an inch in diameter; there are besides about 20 young shoots on each stool about one foot high.

2. About 150 unrooted cuttings six inches high were planted on the 5th October last and in 28 days averaged four feet in height and are now all five feet and almost ready for cutting.—Yours faithfully,

TOM GIBSON.

CEYLON HIBISCUS AND OTHER FIBRES.

London, E.C. Jan. 19.

DEAR MR. EDITOR,—I have taken considerable trouble with the Hibiscus fibre that you sent; one of the fibre firms here value this at £9 per ton, but they say that they would prefer to have this fibre sent home in the form of "ribbons." In this form the China Grass comes to the market now, and the process is very simple for treating it without breaking the fibre. In sending home any fibrous material at the present time, you must remember what the standard is, one may be for string or for weaving, the other is for paper: if it is to compete for paper you must remember that the standard is pine-wood, the pulp from which comes away perfectly white and pure, without any dirt, and cannot be valued at much over 1d. per lb., if as much as that. Ever since pine-wood pulp has got to such a pitch of perfection it is only first-class fibres that they use for spinning or for strings and rope.—Yours truly,

THOS. CHRISTY.

WOODCOCK IN CEYLON.

Ratnatenna, Jan. 20th.

DEAR SIR,—If Mr. Massy, of Carniethan, Ramboda, had read the local papers he would have come to the conclusion, that the woodcock is not so rare in Ceylon as is supposed. The common woodcock has been shot in the island, on several occasions, and as I noted last week it is an annual migrant to these parts, and I frequently come across it between the months of October and May.

E. G. R.

SCIENTIFIC MANURING AND COCONUT CULTIVATION.

SIR,—The writer of the article on scientific manuring in your impression of 28th Jan. is not *au courant* with local agricultural literature. He will find a very full and lucid summary of the startling discovery of denitrification in the November number of the "Agricultural Magazine." It will be interesting to know what English agricultural chemists of the standing of Lawes, Warrington and Gibson have to say on the subject, they will no doubt ere this have instituted practical experiments to test the results of the German scientists.

Cattle manure mixed with so-called artificial manures have been known to yield good results in European agriculture. Perhaps, it may be said that the results would have been better but for the combination. In the cultivation of coconuts locally, the addition of cattle manure to the usual mixture of castor cakes and bones is known to yield better and more lasting results than when they are applied alone. There appears to be one way of preventing or at least minimizing the denitrifying process and that is by using well-rotted cattle manure. Locally this means a well-decayed mass of vegetable matter with mostly all the potash and nitrogen washed out of it.

I believe more than one coconut estate has been experimenting with artificial manures on the lines laid down by Messrs. Freudenberg & Co. But the drawback with coconut cultivation is that the ocular and material demonstrations of improvement are so slow.

The experiments in manuring as suggested by Messrs. Freudenberg & Co. are so elaborate and impractical that I fear they will never become general. Certain substances are not to be mixed as the combination will cause the loss of nitrogen. Then again the application of the other substances are not to be made at once, but at intervals. Altogether the same ground has to be gone over from three to five times. This will add to the cost of application. Then again the mixing of the manures, their weighing and serving out will have to be done under the personal supervision of the Superintendent. He cannot delegate the work to a subordinate. Then there is the strange suggestion that the manure should be buried in *deep* holes to reach a large root surface. Usually wide holes are used to attain this object. The unwisdom of applying such soluble substances as those recommended, especially sulphate of ammonia, in deep holes impressed itself on me. I found this view supported by Mr. John Hughes in a recent communication to the *Observer*.

I was always struck with the yellow color of the fronds of coconut trees growing on sandy soils. I tried to account for it by attributing it to the presence of water at the roots; but against that theory was the fact that coconut trees growing on rather high, sandy soil had also yellow fronds. Mr. Leclerc has said that "the yellowing of plants is due to defective transpiration and not to excess of moisture in the soil. When the air is moist, transpiration is slow, when dry it is fast." Another authority says:—"Sandy soils are powerful attractors of the moisture of the atmosphere. On the sandy plains of Chili vegetation is almost entirely dependent on dew for its moisture." That may be one explanation. I have given the matter much thought and my theory is that coconut trees growing on sandy soils suffer from what I will call vegetable anæmia due to the almost entire absence of iron in the soil. Chlorophyl, or the green colouring matter in leaves, is found only when iron is present in the soil. Without chlorophyl the assimilation of plant food by the leaves is not possible. Anæmia may be due to other causes as well, such as debility due to want of cultivation. In red clayey or cabooky soils, the yellowing of the leaves from want of cultivation is not so apparent and marked as in sandy soils, for they have a large admixture of iron in their composition. In the animal economy, the red blood corpuscles take the place of chlorophyl in the vegetable economy. Their absence is remedied by the administration of iron. Iron has been proved to be applied with benefit to vegetation. We read in the "Ceylon Manual of Chemical Analyses" that "it was formerly considered that most soils contained sufficient iron for the use of plants, and that it exercised rather a hurtful effect on plants. Dr. Griffiths appears to prove the efficacy of applying iron in a soluble form even to land already containing a considerable proportion of iron in an insoluble form He says that his original proposition, that a fairly large proportion of soluble iron in a soil is favourable to the growth of plants, developing a large amount of chlorophyl, has been confirmed by all his subsequent investigations. He strongly recommends sulphate of iron both as a manure and as an antiseptic substance for application to other manures."

This brings me to the subject of Basic slag. It is obtained when converting iron into steel in crucibles lined with limestone. Mr. Thomas discovered that the phosphoric acid in the iron combined with the lime in the limestone and formed phosphate of lime. Hence its name, Thomas's phosphate powder. He experimented with it and found it a valuable fertilizer. Its weight suggests a large proportion of iron. Perhaps Mr. Cochran will be able to tell us whether in a soluble form or not. If in a soluble form, the beneficial effects of its application to sandy soils especially will be beyond question, for by the development of chlorophyl the assimilation of the plant food already in the soil and that applied as a manure will readily take place. I should wish to see this question discussed bay scientist. B.

THE PROTECTION OF GAME.

Ratnatenne, Madulkele, Jan. 21st.

DEAR SIR,—I have read with interest your article on the Protection of Game, and am only too glad to hear evidence for the other side.

There is I admit some danger of game being over-protected, which practically comes to the same thing; as being protected for the sake of Sport and Sportsmen.

This is a danger which must be carefully guarded against.

Such proposals for the protection of game, as the returning of all *native* firearms at the commencement of the close season, may be passed over as absurd.

We come then to *reasonable* measures for the protection of game, and I am firmly of the opinion which I believe coincides with your own that the existing ordinance if really put in force, together with the establishment of *sanctuaries* for game in *un-inhabited* districts meet all requirements.

It is *not* so much in populated districts, that game requires protection as in almost uninhabited wilds.

This may seem absurd, but a knowledge of the subject soon proves the correctness of the statement. Almost all the populated districts, more especially those of the Central, Western and Southern Provinces, and great areas of the North-Western Province; are well within the influence of the two monsoons. These districts either on account of their mountainous nature or the thick growth of forest and scrub which covers the waste lands afford *almost* sufficient protection to game, without the intervention of law. In the great wildernesses of the Northern and Eastern Provinces, the habitat, par excellence, of the Spotted Axis, and Buffalo the case is different. Here on account of the open nature of the land, and the dry seasons, game of all kinds is at the mercy, not of the villager, for practically, the villager does not exist there, but of the hide and horn *merchant*. It is therefore not the villager from whose raids game should be preserved, for the Sinhalese villager at any rate, is as a general rule innocent of any idea of accumulating wealth in this line; but it is the vagabond Moor with whom we have to deal and his hunting grounds are the aforesaid open plains and dry wastes of the north and east and *no* legislation—no measures can surely be too severe to apply against him and him only.

It is perhaps not generally known, that the chief offenders are not those whom we meet down in the wilds, but that they are in our midst.

By store-keepers in Matale, Kandy, Badulla and elsewhere—a common practice amongst these scoundrels—is to obtain a licence from the Kachcheri to collect myrabolams, wild cinnamon bark or such jungle produce; with this licence, a

gang of armed ruffians is despatched to the haunts of deer; and the slaying and collection of hides and horns and peafowl feathers goes on gaily. Should any official be in the neighbourhood a certain quantity of jungle produce is kept ready in case of necessity. The licence and the produce will of course be forthcoming on the appearance of the G.A. or any of his subordinates.

Needless to say the hides, horns and meat will *not*. It is with these marauders that the Game Protection Society desire most earnestly to deal effectually; and not believe me, with the usually unoffending villager.—Yours faithfully, E. G. R.

CACAO IN UKUWELA DISTRICT.

Kaduwella, Ukuwella, Jan. 22, 1898.

DEAR SIR,—Might I suggest that you publish names of correspondents who write so dolefully to you about Cacao Disease (so called) and its probable effects. Has it never struck you that you are allowing your paper to be made a medium for the systematic depreciation of all cacao property. On this estate, I have not seen any of the disease your correspondents write about. Marakona, an estate in the neighbourhood is also free from any disease, and dare say the same can be said of a great many more estates. Why should the value (in the market) of these estates be run down by allowing anonymous correspondents to write as if the whole of the cacao estates in Ceylon were plague stricken?

Is it any new thing for cacao to die off in patches after a very wet season or even for coffee or tea to die out in small patches here and there!

I have known coffee to die out from no apparent cause and the same with tea. Do you remember the Indian planter discovering a disease in the tea plant in the Kalutara district which was going to wipe out tea entirely? This was some 6 or 7 years ago, but I am told tea is stil extensively grown in Kalutara.

Eight trees have died out on this estate since I took over 2½ years ago: 4 of these were killed by white ants, and had no tap root, and the other 3 died from, what I suppose is, the mysterious disease, supposed to affect cacao, but which I put down to wet feet.

I would not have troubled you with this letter did not I consider it a duty I owe to my employers to protest against the wild writing of anonymous correspondents *re* cacao prospects. I do not think it is too much to ask that men who write on the subject should sign their letters so that one may be able to judge of the value of the opinion offered or the *facts* stated.—Yours faithfully, JOHN MACDONALD.

[Mr. MacDonald's letter reminds us of letters we were accustomed to get from some coffee planters before Mr. Marshall Ward's arrival in Ceylon. Not that we mean the parallel to go further; for we are very pleased to learn of estates and districts, where cacao is flourishing. But we can assure Mr. MacDonald that we have allowed no one to write on the subject without being certain of his personal experience and responsibility and of his having a good purpose in writing. Now, for instance, our last contributor wrote, as he did, in order to show the Government, the urgent need of attention and of its employing an Analytical Chemist, as well as a Cryptogamist, to aid Mr. Willis in the Cacao investigation. Our present correspondent is fortunate in being in a district little affected, we believe; but suppose he was in charge of a plantation such as was last described, and its proprietor at home, would he feel justified in writing in his own name and proclaiming the property—or would he feel justified in remaining silent, while the Government did nothing to investigate the cause of the Cacao dying out in his neighbourhood?—ED. *T.A.*]

FRESH-WATER FISH.

DEAR SIR,—Now that water is at a low ebb in the fields and water-courses in the suburbs around Colombo, fresh water fish is brought for sale in large quantities into the town, where it finds a ready market, almost exclusively among natives, but there are a few varieties of these fish which are acceptable to the European palate; of these may be mentioned the *lula*, the *anda* and the *welligowwa*: all these varieties are more or less known to the older residents upcountry. When properly cooked these fish are delicious and wholesome.

That esteemed upcountry resident, the late G.A.C. was a great believer in the *lula* and he wrote in praise of it to the *Observer* in the early seventies and maintained that the *lula* compared favourably with English soles. An old District Judge of Negombo insisted on having *welligowwas* (Ceylon whiting) for breakfast every morning, and growled fearfully at his "boy" if he failed to procure them!

The *anda* (Ceylon eel) is also very much relished: old Dr. Boake was always well satisfied with a meal when the *menu* included stewed eels. Very fine ones used to be caught in the *lake* near Captain's Garden, nearly opposite the doctor's residence. C.

[The Cold Storage and Refrigerating Managers are on the lookout for local supplies of fish, game, &c., to preserve and supply from time to time.—ED. *T.A.*]

PLANTAIN FLOUR.

DEAR SIR,—I should be glad if any of your readers could tell me where I could obtain plantain flour. I should mention that it is required for purposes of experiment, on the result of which will be determined its suitability for certain special purposes. About 28 lb. is wanted for the test. Is there here an opening for a new industry, or is at present the local demand for the fruit in its raw state as food so great that it fully equals the supply? From what I know of plantains, the ordinary table kinds are too sugary for conversion into flour, unless, perhaps, when treated in the unripe state. Possibly, the curry plantains would answer better. I am told by an esteemed correspondent that he once made some plantain flour, but found it did not pay. Possibly since then, however, circumstances may have altered: and I shall be glad if this letter elicits information on the subject.—Yours faithfully, C. W. H.

Feb. 8th.

DEAR SIR,—In reply to C. W. H.'s enquiry, there is no plantain flour made in Ceylon at present, but it is an article in which an immense trade might be developed. For general purposes the 'curry' plantains are most suitable: the sweeter kinds, if taken before they ripen, would be useful for cakes and dessert biscuits. The preparation of the flour is simple and inexpensive, and as to the *cost* of the fruit, the difference between wholesale and retail prices is so large that growers would be very glad to see not only a new industry spring up in the manufacture of flour, but another, perhaps of almost equal importance, the preparation of dried and crystallized plantains, for which we have in Ceylon several varieties specially suitable.—Yours faithfully, PLANTER.

Ratnapura.

SIR,—In reply to "C. W. H." and plantain flour experiments: if he will write to me, or I now give him, some useful hints about preparing the table and sugary varieties when ripe, (and a superabundance of fruit are on hand). Cut them in two, thoroughly dry in the sun (desiccate them till they rattle like apple chips). Then get some large mouth bottles or jars—pack away a layer of chips—and pour over each layer some burnt sugar and brandy, or over two or three layers. It will soak down gradually through the dry fruit. Stacked away it will keep for years and taste exactly, and nicer than, figs. It is astonishing how nourishing and supporting the food is, and it can be eaten with bread. It packs away in an incredible small space; a full bunch of one hundred or one hundred and-a-half could almost pack down in an ordinary table salt bottle. When drying the fruit, it is advisable to do it under mosquito netting to keep off flies. The squirrels too make raids upon it, and run off with great quantities. I once caught four squirrels in a day in an ordinary box wire trap. The fruit should be dried on a clean mat, and turned several times a day to get all parts evenly dried. It can be packed away when dry without brandy and sugar, but does not then taste so much like preserved figs.—Yours truly, JAMES GRAY.

RAMIE AND INDUSTRIAL WORK.

School of Agriculture, Colombo, Feb. 1.

DEAR SIR,—I am sending, for your inspection, some specimens of Ramie fibre lace—kindly made for me at the Kandy Convent—which testifies to the suitability of the fibre for delicate textile articles as well as to the excellence of the work done at the Kandy Convent. The thread was some left with me by Mr. Macdonald, of Macdonald, Boyle & Co. I also enclose specimen of fancy work done on the leaves of the elephant creeper (*Argyreia speciosa*).—I am, your faithfully,

C. DRIEBERG.

[The specimens, which are extremely interesting and well-executed, can be seen at our office.—ED. *T.A.*]

TEA ESTATE EXPENDITURE AND ECONOMY:—No. 1.

4th Feb. 1898.

SIR,—Your leader today on economising labour I have read. My experience for the last two years is that I have saved 4 cents a lb. on made tea by plucking for cash. That coolies paid at so much a lb. easily pluck double the amount those do whose names are put down as a day's labour. Women at 25 cents say, as for other works. As regards coolies settling down, "as long as the tundu system holds good so long will they be discontented." If an oriental can increase his liabilities without any intention of repaying them by demanding a tundu and actually getting helped by his employer to do so by having one given him, what do you expect?

I have given up the tundu system, have been threatened with Court, given proctor's notice and leaving; but all have ended and I make when they found I did not care what they did. They all *acknowledge* that *without a tundu* they CANNOT GET MONEY. The CURE is in and on OUR OWN HANDS.—Yours truly,

MANAGING PROPRIETOR.

NO. II.

5th Feb. 1898.

DEAR SIR,—Your yesterday's paper has a very sensible article on retrenchment of expenditure on estates, this is a subject you will see will have to be taken up in a very short time, for, I have seen for some years back a great increase in cost of all works, this is simply caused by the present class of Superintendents, many, of the estates are in charge of. I could give you many instances; but it is not for me, nor would it do you any good in the meantime if you were to publish them. The man that has lots of coolies is the best superintendent; but, before the year is out, mark my word the man that can do his work cheapest will have the cake. I know of an estate that gave the Superintendent leave for 10 months and the man that took his place was a Sinna Dorie, got lots of coolies; cost of tea increased 5 cts. per lb and estimate short by 11,000 lb. Such are the facts the shareholders will have to face.—Yours, MANAGER.

P.S.—I think Mr. Campbell had no right to give such a speech before Mr. H. Skrine's motion the other day at the P.A. meeting. That was how a previous Chairman in the 80's disgusted people.

M

CEYLON TEA IN AMERICA.

Kandy, 4th Feb. 1898.

DEAR SIR,—I annex extract of a letter received by Mr. Campbell from Mr. William Mackenzie, dated London, 14th January, 1898, as follows:—"I have been advised by the National Bank of a credit for £4,000. I have written to New York, arranging for a continuance of our work, and should (D. V.) arrive there myself about the time this reaches you.

"I have had a proposal for some strenuous pushing in Winnipeg and West of Canada, and may do something in that quarter in view of the rising importance of the N.-W., since the gold discoveries.

"Mr. Talbot, sailed for Ceylon to-day.

"I may go to Ceylon in April, to give a personal account of my stewardship."—I am, dear sir, yours faithfully, A. PHILIP,

Secretary to the "Thirty Committee."

THE CACAO FUNGI AND REMEDIES.

Kaduwella, Ukuwela, Feb. 7th, 1898.

DEAR SIR,—I hear that the Cryptogamist has discovered not one, but two varieties of fungi living on our cacao. Now I do not wish to be little the work of the Cryptogamist: on the contrary, I believe, he will be able to give us valuable information and perhaps instruction. At the same time I can't help remembering the little assistance, Coffee Planters received from the labours of Messrs. Morris and Ward. In fact, I believe, coffee would have lasted 4 or 5 years longer than it did, if we had not carried out Morris's instructions in applying sulphur and lime. The lime had the effect of making the trees give an enormous crop, which in their debilitated condition was too much for them and so died off, when if it had not been for the overstimulant they might have gone on giving small crops for years. What I would like to suggest is that planters, whose estates are suffering from the disease, should select a piece of soil close to a dead or dying tree and have a sample

of it lifted and sent for analysis. To be perfect it would require four samples to be taken as follows:—a cubic foot of the surface soil, a cubic foot immediately below that, and so on, till a depth of four feet is reached. Each of these samples, on being lifted, should be carefully weighed, put in a box, and sent to the chemist as soon as possible. I think the Agricultural Chemist is more likely to give practical help than the Cryptogamist. I offer the suggestion for what it is worth.—Yours faithfully,

JOHN MACDONALD.

[We would advise Mr. MacDonald and others not to listen to rumours of what Mr. Carruthers has discovered or suggested, until they see it above that gentleman's name. We have the fullest confidence in Mr. Carruthers' prudence as well as scientific skill. At the same time experiments such as are suggested by Mr. MacDonald can never come amiss.—ED. *T.A.*]

CACAO LOOKING UP IN PRICE.

"The Grove," Ukuwela, 8th Feb., 1898.

DEAR SIR,—The enclosed from "the Lane" accounting for the hardening tendency of the cacao market may interest your readers. This rise in the market, unlike the inflation caused by a Trans-atlantic fashionable demand a few years ago, which came and went like all fashions, appears to be founded on a permanent basis.—Yours faithfully, JAS. H. BARBER.

21, Mincing Lane, London, E.C., Jan. 21st 1898.

J. H. Barber, Esq., Matale, Ceylon.

DEAR SIR,—We had this pleasure on the 7th inst. and are since without any letter from you.

COCOA P. "MAKASA MARU" ss.—We have to advise the following sales:—

				s.	d.
Leville A	..	20 bags cocoa	at ..	78	6
,, B	..	9 ,,	,, ,, ..	75	0
Leville B	..	14 ,,	,, ,, ..	75	0
Grove A	..	32 ,,	,, ,, ..	77	0
,,	..	29 ,,	,, ,, ..	76	6

These prices show fully 5s per cwt. advance on rates obtainable before Christmas and we trust they will be deemed satisfactory.

The rapid advance in the price of cacao has been caused chiefly by the opening of the several new manufactories such as Dr. Tibbles, whose advertisement of Vi-cacao you have no doubt seen. If as many anticipate the consumption of cacao is largely increased throughout the United Kingdom by means of such advertisements, we anticipate a very firm market throughout the spring and the earlier shipments are received here the better the result is likely to be.—Yours faithfully,

HARVEY BROS. & CO.

BORERS *vs.* CACAO AND DADAP TREE.

Kandy, 9th Feb., 1898.

DEAR SIR,—Herewith a block of dadap wood from a tree in the vicinity of cacao attacked by the boring beetle (Fomicus perforans). It may be worth while to find out why the dadap trees are bored by the same beetle "or a closely allied species" to that attacking cocoa. I have also noticed gumming—or exudation and crystalization of the sap—preceding decay of the tree. Evidently fermentation of the sap, attracts the beetle. All beetles are fond of fermented liquor. Beetles and poochies of sorts are caught at home with a mixture of rum and sugar, plastered on the tree trunks. Also with porter and stout and water. The cure of the disease may depend,—on what causes the sap to ferment.—Yours faithfully, VEDDA.

[The block of wood referred to has not yet come to hand: when it does, we must certainly have it examined.—ED. *T.A.*]

THE CEYLON TEA CAMPAIGN IN AMERICA.

DEAR SIR,—In a letter to Mr. Campbell, dated London, 19th January, 1898, Mr. Mackenzie writes:—

"As I go to America next week, this may be the last letter from me while you are chairman. I must thank you for the interest you have evinced, and your kind dealings with me. I am sending you a report of last year's work from Mr. Larkin, and a lot of tea advertisements. I think the Committee will agree with me that he well deserves all the help he gets. He is by far our best friend. He forces others to follow in his steps."

I also send a letter from a well-known firm working in America, but with headquarters here, explaining where our teas lack the roll and make of Indians and Javas. They tell me they have been obliged to substitute Javas for Ceylon in some of their blends. Were there enough of Javas we would be great sufferers.

IMPORTANT LETTER ON DEFECTIVE MANUFACTURE.

ANOTHER "BATTLE OF THE STANDARDS."

W. Mackenzie, Esq., 39, Netherall Gardens, Hampstead, N.W.

DEAR MACKENZIE,—With regard to the conversation we had the other day in Leadenhall Street about Ceylons and Javas, I am now writing to confirm what I said about them then.

There is no question about it that many of the Ceylon teas now being imported are very inferior, both in liquor and in make, to Java teas. Until quite recently, with the exception of a few Java marks the bulk of the teas from that country were very inferior in flavour, but recently, especially during this year, the imports have been of a very much higher quality, and I make bold to say that better Java teas can be bought at 6½d to 7½d a lb., than Ceylon at 8d. Not only is the superiority marked in the dry leaf, but also in the liquor. The teas are exceedingly well made, very closely rolled with a fine amount of tip, and very heavy for bulk, compared with Ceylon teas, which are in the majority of cases very open leafed teas, and weigh very light by measure. I have before me now a Java pekoe, costing 6½d with a very pure, pungent liquor, and excellent quality. If I were to place sufficient of this tea into a one lb. tin without pressing it in, just to fill in and shave it off with a paper knife, and were to weigh the Ceylon tea in the same tin, in the same way—say a Ceylon pekoe at 7½d to 8½d—(that is, the majority of Ceylon teas) it would be found that the Java, bulk for bulk, would weigh 10 or 15 per cent more than the Ceylon tea, consequently the consumer weighing out sufficient tea, say four or five spoonfuls of Java, would use the same bulk of tea as if he took out Ceylon tea, but as a matter of fact the five spoonfuls of Java would weigh as much as about six spoonfuls of Ceylon, consequently the tea would come out stronger and better, the consumer would be better satisfied and the retailer would benefit to the extent of selling one spoonful in five more of tea by using Java than if using Ceylon. Where one is retailing hundreds of chests a week, this is a very im-

portant matter, and I urge upon you to do all you can to make this fact known to Ceylon. The number of Ceylon teas that come to this market now, either very open in leaf, badly rolled, or rolled to powder, is extraordinarily large, and it seems a pity that it shuts out a great many teas from markets where they might find a remunerative outlet. Where teas are very small and very open, I fancy it must be either from a considerable over-wither, or from under-wither, whereas in the case of the Javas you only have to look at the teas to see that the withering has been perfect in every respect, otherwise the even small pekoe leaves could not be made. Of course, they might pluck finer there than in Ceylon, I cannot say, not having been to that country; but this is a complaint with all the dealers in Ceylon teas, that they don't come up to the Java or Indian teas in style of make. Were they to do so, were they to be heavier, bulk for bulk, there is no doubt in my mind that the consumption of Ceylon tea—already satisfactory—would at once show a large increase, in fact, the difference would amount to eight or ten millions in the year if it were possible by some "fait legendaire" to ensure that every lb. of tea leaf in Ceylon were rolled as well as it is possible. Of course, this cannot be so. At the same time, there are a great many go-a-head planters who, if only they knew the importance of it, would certainly take means to have their teas more closely rolled, and there is no other way I can think of in which Ceylon planters can make their produce more valuable than by paying more attention to close rolling and good make. As I told you the other day, I would rather remain anonymous in communicating this to you, and so I will simply sign myself."

I am, sir, yours truly, A. PHILIP,
Secretary to the "Thirty Committee."

INDIAN TEA IN INDIA—is the heading of at sub-editorial in the latest *Globe* (Jan. 21) on a subject which has often attracted attention. Why should on it the millions of India, Burmah, Siam, Straits, Java and Ceylon drink tea as well as the Chinese and Japanese? There is certainly room for increased consumption in Asia. If all our common teas were so used, it would be well for tea planters :—

The conservatism of the people of India is very marked in their reluctance to use their own tea. India produces annually about 137 million pounds of tea. Of this 132 millions is exported, no less than 124 millions going to the United Kingdom. Only five millions of pounds, therefore, remain in India for the consumption of 300 millions of people; while the United Kingdom, with only about 40 millions of people, takes 124 millions. In other words, India uses less than half an ounce per head per annum of its own tea, while each inhabitant of the United Kingdom consumes on the average about five and a half pounds. The contrast between these figures becomes the more marked when we learn that the bulk of the tea used in India if consumed by the English community there, no fewer than one million pounds—out of the total of five millions—being purchased for the use of the British soldier alone. It is not that the natives of India have any prejudice against the use of tea; for they like it, and rate its medicinal properties against fever very highly. It is merely that tea, as a beverage and a luxury, has not yet found its way into the daily life of the natives, although the consumption is increasing year by year among the population of the larger towns, especially among the Mahomedans. The Indian tea-planting industry has, therefore, a splendid future before it. Not only is it fairly dividing with Ceylon the markets of the world, from which the merits of both have practically ousted China tea, but in the slowly educated population of 300 millions of native Indians it will have a new market of its own in the future.

PLANTING NOTES.

VANILLA IN CEYLON.—A young German who has been tea-planting in Ceylon for some years has purchased an estate of nearly a hundred acres, on which he intends cultivating vanilla.—*Chemist and Druggist*, Feb, 5

"THE CEYLON FORESTER."—A Quarterly Magazine of Forestry, Natural History and Shikar. Edited by H. P. C. Armitage, Assistant Conservator of Forests, Jaffna. Fourth Quarter, 1897. No. 7. Contents :—The Terrestial Mollusca of Ambagamuwa; Para Rubber; Reviews; The Admininistration Report of the Ceylon Forest Department, 1896; Firewood Forests, Mirigama; Mexican Rubber; Experiments to Test Durability of Wood; Utilization of Forest Produce; Extracts; The School of Forestry, Ceylon; Sleepers on the Railway; Value of Teak.

INDIAN COFFEE IN CEYLON.—There is a very good business done in this line, chiefly among the Tamils of the Pettah and their neighbours of the Coromandal Coast. Fairly good sized parcels are often imported and there is a ready sale for them in the local bazaars. The grades are chiefly "triage." Occasionally parcels of "Native" are brought down to Colombo, and these mixed with our own of the same name are sold to exporters, and pass off as entirely Ceylon "Native." It is generally well known that our Island's produce in this line has a better marketable value than the Indian, which has not the same delicious flavour as, that of good old Uva !—*Cor.*—Local Examiner Feb. 17

FIXING BARBED WIRE.—Commence by first passing a complete turn of wire round one end post, and securely fasten it with stout galvanised staples; then carry the wire to the other end, and having gauged the approximate distance between extreme supports, bind two or three turns of the wire round a piece of quartering, by means of which using it as a lever against the back outer edge of the post, the intervening line of wire may be tightly strained across the face of the post, where it should be secured. The lever can then be removed, and a turn of wire passed completely round and stapled to the post in order to keep the line strained. An assistant will probably be wanted during the straining process, and it will be desirable to fix spurs to the inner sides of the end posts to prevent them being pulled over. A single staple driven in each intermediate post will be sufficient to keep the wire in position, and if more than one row is to be fixed, secure the top one first and the bottom line last.—From *Work* for February.

CIRCUMSTANCES ALTER CASES.—It has been assumed that Mr. Chamberlain's reference to the proposed grant-in-aid of the West Indies was intended to apply to sugar growing. It is now pointed out—says the *Home and Colonial Mail*, of 4th February—that this aid will be offered not to support the sugar industry alone, but it is to help in starting new planting industries. If this be so it will be in accordance with the recommendation of Sir Henry Norman's commission, but it will also be unfair to planters elsewhere. For instance, how would Indian and Ceylon tea planters feel if planters in our West India possessions were assisted by the State to grow tea in competition with India and Ceylon. It is claimed that the soil and climate of some portions of the West Indies are suited to tea planting, so that such a situation might occur. When the Ceylon coffee growing enterprises came to grief, we are not aware that the State came to the rescue, nor did Parliament vote a dole to enable planters in the island to develop other products. The Ceylon planters were left to their own resources, and had to fatten on their own enterprise.

THE NEW ESTATES MAP AND DAYS OF OLD:

RESIDENTIAL PROPRIETORS v. LIMITED COMPANIES—INFLATION OF TEA SHARES —TEA PROFITS—THE *T.A.*

Your new Planting Districts Map is excellent, and supplies a very much felt want; but oh what visions it recalls of blasted hopes and departed friends, and oh what changes many for the better—and some for the worse!

Even the good old days of open house hospitality which plunged so many of us as youngsters into debt and which have naturally disappeared before increasing population. But how pleasant it was to be able to ride up to any bungalow between Matale North and Morowakkorale and call for breakfast and for dinner and a bed and feel that you were a welcome guest even if you had an absent host!

But the most serious change which has come over Ceylon and which will be felt much if bad times arrive, is the rapid elimination of the residential proprietary which socially and financially made Ceylon what it is today. What prospec is there for youngsters going to Ceylon now? If they have money they can play pitch and toss with tea shares which they can do quite as well in London: if they have not money they are destined to be hirelings for life and when the pinch of hard times comes to find —as has been found in some cases, already—that Directors have to do their duty to shareholders first; to their employés afterwards.

The inflation in tea shares has been followed in London as in Colombo, by a very rapid and very natural depression. Many of the shares were far too high, not only because they were and are good things in themselves but because the abundance of cheap money and the difficulty in finding investment for it drove people to be contented with a rate of interest on tea shares, which was altogether inadequate to the nature of the investment. Some good securities are as much too low now as they were too high before; but they will soon adjust themselves and find their level at about seven per cent which is what investors should look to as a fair return for tea share property.

The rise in the rupee takes a little of the gilt off tea production, but not so much as it gets credit for and it cannot be held mainly responsible for the present tightness of the money market. The wage of the cooly is the chief if not the only thing, by which the tea planter gains by a cheap rupee; and I believe a settled rupee about 1s 4d would in the long run be advantageous. Taking the day's wage at 33 cents, the sterling equivalent with a one and four penny rupee is 5·28d; surely a low enough wage, with a one and two penny rupee 4·62d and if the rise in the sterling value of the day's wage is accompanied by a fall in the silver price of tea lead, machinery and all other estate requisites which have to be paid for in gold—and which should certainly result—and by a possible fall in the price of rice, a reduction in coast advances and a rise in the price of tea all of which theoretically should follow, the apparent loss to the planter will be counterbalanced.*

The *Tropical Agriculturist* for the past year has been splendid, and the Photographs and Biographical Sketches of our friends,—some gone and some still with us,—remarkably good, though the latter are in some cases veiled by the modesty of the autobiographer. J. L. S.

LONDON, Jan. 28.

* But J. MacEwan says Indian and Ceylon Tea-planters lost £2,000,000 last year through the artificial rupee!—ED. *T.A.*

TEA IN SOUTH TRAVANCORE.

Mr. Joseph Fraser has returned from his visit to South Travancore and is favourably impressed with the appearance of most of the tea he saw, while the rich jungle-reserves and soil are all that could be desired. He does not think that South Travancore teas will ever attain a high position in prices; but planters can make up a good deal for this by quantity and in low cost of production. In the case of one group an average outturn of close on 700 lb. an acre was realized including plucking from some three to four years old tea, and this was turned out at about 20 cents per lb. This must be considered very good. The great trouble is that of "labour." Coolies are most plentiful at present; but when their own harvest comes in April and May, just as there is a "rush of leaf," they want to go home. With coffee, the case was different, as the ripening of crop was in September and October. For young planters with some capital and a good deal of pluck and perseverance, South Travancore should prove a good field for operations.

THE RICH TRADE OF THE UPPER AMAZON RUBBER REGION.

By Joseph Orton Kerbey.

Here is a rich country, almost equal in area to all of the United States east of the Rocky mountains. The natural products of India-rubber, balsams, nuts hides, etc., are of such value that there must always be a market for them. Amazonir, then, can never be a poor country; the people can pay liberally for all that they need, and they buy a lot. They can produce a great many commodities—sugar, cotton, coffee, cacao —but they prefer to concentrate all their labour on the more profitable occupation of gathering India-rubber The United States buys the greater share of their rubber, paying for it through English banks, the money being used to buy cheap English goods and cheaper German goods for this market. It may be news to some of your readers that a regular service now exists between Peru and Europe by which Iquitos obtains the benefit of a steamer direct every forty days, by either the Booth or the Red Cross line.

The principal business house of Iquitos is that of Wesche & Co., a German firm who are conceded to handle more goods for the Ucayali and Javary and the rivers behind than any other house in the Amazon country. They seem to have succeeded the Mourrailles—the senior of whom has retired after the accumulation of a large fortune, though the house of Mourraille & Hernandez still do an immense trade. The present manager for Wesche & Co., is Mr. Julio Weiss, a young German of energetic temperament, whose thorough-going methods disprove the assertion that all foreigners soon become lazy in this climate. The firm own four steamboats, which may be termed floating stores, since they ply the different rivers in Peru, exhibiting their goods on shelves at the various landings, taking orders, and receiving Caucho and other produce of the country in exchange. In answer to my inquiries, Mr. Weiss unhesitatingly told me that their stock of goods at present exceeds in value $1,000,000, gold. The extent of their business may be judged from the fact that they receive no less than 5,000 packages of freight every month. Mr. Weiss is thoroughly German, and he proudly boasts that every one of these packages comes from the "Fatherland." Yet he astounded me by frankly admitting

that the capital of the house was altogether American—being supplied by Messrs. Charles Ahrenfeldt & Co., of New York (Nos. 52-54 Murray street) and Paris. Every employe of this large Iquitos establishment is a fair-hired German; even the officers of their various steamboats give their orders in German.

The largest and longest tributary of the Amazon is the Ucayali, formed by the junction of the Tambo and the Uruhamba rivers, in the foothills of the Andes, and flowing northward for about 1,000 miles. It reaches the Amazon some five or ten hours' travel above Iquitos. The Caucho supply, once so plentiful on the Ucayali, has become almost exhausted along that stream, and on its affluents flowing from the west. By their reckless methods of destroying the trees, the armies of *caucheros* have ruined their occupation within the old limits, and are obliged now to go to the headwaters of the Ucayali, and to the tributaries which now from the east, having their source in Bolivia and Brazil. Whenever the latter are reached, the divide is soon passed which marks the watershed of the Jurua, another large tributary of the Amazon, parallel with the Ucayali, but claimed by Brazil. The effect of the destruction of the Caucho on the Ucayali, in connection with the opening up of communication by these numerous affluents reaching the Jurua, in Brazil, would seem to be bad for Iquitos. Naturally the route from the Caucho fields *via* the Jurua or even the Purus to Manaos will be very much more direct than *via* Iquitos. There would be a saving of 1,000 miles, at least, and the advan age of the market of Manaos, with telegraph communication and regular steamer service, might more than offset the low export duties charged on Caucho in Peru. Brazil exacts 22 per cent of the value of all rubber exported from her territory, while Peru requires only 5 centavos per kilogram on Caucho and 8 centavos per kilogram on India-rubber.

Para, Brazil, December 4, 1897.

A SIMPLE RECIPE FOR LIVING TO BE A HUNDRED.

1. Eight hours' sleep.
2. Sleep on your right side.
3. Keep your bedroom window open all night.
4. Have a mat to your bedroom door.
5. Do not have your bedstead against the wall.
6. No cold tub in the morning, but a bath at the temperature of the body.
7. Exercise before breakfast.
8. Eat little meat and see that it is well cooked.
9. (For adults) drink no milk.
10. Eat plenty of fat, to feed the cells which destroy disease germs.
11. Avoid intoxicants, which destroy those cells.
12. Daily exercise in the open air.
13. Allow no pet animals in your living rooms. They are apt to carry about disease germs.
14. Live in the country if you can.
15. Watch the three D's:—drinking-water, damp and drains.
16. Have change of occupation.
17. Have frequent and short holidays.
18. Limit your ambition; and
19. Keep your temper.

SIR JAMES SAWYER, in *Church Bells.*

[Written for residents in a temperate climate.—ED.]

COFFEE IN B.C. AFRICA.—If the export of coffee as given in the "Gazette" is the total for the year, it shows—says the *C. A. Times*—that we have over-estimated by some fifty tons last year's crop. 853,080 lb. is only equal to 380 and about three-quarter tons, whereas the estimate was about 450 tons. A certain amount must be allowed for the coffee retained in the country for seed and consumption, but that, we should think, would not exceed 15 tons at the outside.

"SORTING TEA: NO. 1."

Machinery has done much to spoil the sorting of tea. In all the other processes machinery has improved tea, but in this, which is perhaps a very important factor to good prices, it has helped the managers to get the work done quickly and cheaply, but it has done away with the old "niceties" of the work. In the old days, when our tea was about three times the present price, we used to make Broken Orange Pekoe, two Orange Pekoes, two Pekoes, Broken Pekoes, Pekoe Souchong, Pekoe Fannings, Red Leaf Fannings, Pekoe Dust, and Dust; that is to say, eleven "sorts" of tea. And all these teas used to get different prices, ranging from ten annas as the lowest to two rupees or so for the highest, thus allowing several annas between the No. 1 and No. 2 of the Pekoes and Orange Pekoes. Nowadays, when perhaps we have only two annas difference between our best and our worst tea, it may seem absurd to "sort" carefully, and arguing on these lines, some managers have come down to three sorts—Pekoe, Pekoe Souchong and Broken Tea. Each one has come to his own conclusions from experience or expediency, and we have concluded that careless sorting is nearly as harmful as carelessness in any of the other processes of tea making. We argue in this way: If you take five pounds of Orange Pekoe and throw it into 100 lb. of Broken Tea, you have lost several annas. Suppose that the Orange Pekoe sells for 12 annas and the Broken Tea sells for six annas then you have lost 5 × 6 = annas. Then by way of experiment you throw 8 lb. of Pekoe into 100 lb. of Pekoe Souchong, the one being sold for 8 annas and the other for 7 annas, then you have lost 8 annas. Again, if you go further than this and put 20 lb. of Orange Pekoe into the Broken Tea you may raise the price of the Broken Tea by two pice (=50 annas), but you lose 20 × 6 = 120 annas. It is impossible to be definite; but the conclusion is that you lose good tea by putting it into lower class tea without raising the price of the lower grade; and by leaving lower grade tea in the grade above it, you reduce the price of the higher grade.

No one makes tea so coarse as to have no Orange Pekoe in it; and, however small a percentage it may be, it would pay to separate it from the coarser teas. It is possible to carry this idea too far; for instance, by repeated cutting and sifting through a No. 14 sieve one can each time get tea of the *size* of Orange Pekoe, but all these mixed together would make a very bad Orange Pekoe: it would cease to be real Orange Pekoe after the first cutting, and after that it would be cut up Pekoe and cut up Pekoe Souchong, and these would also be very grey and unsightly. The perfection of sorting is as follows: The whole tea is put over a No. 14 sieve either untouched or gently disintegrated by hand; it must be a hand sieve made of cane and shaken until tea ceases to fall through freely; this makes Orange Pekoe No. 1. The tea above the No. 14 is then passed over a No. 12 sieve, and you get Pekoe No. 1. The tea is now cut up by any sort of machine or crushed by hand and again put over No. 14, which yields No. 2 Orange Pekoe; then over a No. 12, which gives No. 2 Pekoe. The residue is then sifted through a No. 10 sieve, and it is cut up time after time till all goes through. This when fanned makes Pekoe Souchong and Broken Tea. Broken Pekoe is got out of the Orange Pekoe by fanning, also out of the tea which drops through the sieves when firing, and nowadays a good deal of Orange Pekoe and Broken Pekoe is obtained by sifting the leaf before firing.

The crudest method of sorting is to cut up the tea with a machine breaker, and put it through a cylinder consisting of a No. 12, No. 10 and No. 8, then cut up the residue, or tailings, and send them through the cylinder again. By this means the work is done very speedily, but the result is, that each grade consists of a mixture of each sort more or less cut up. This style of machine accounts for the small difference in price to be found in many marks, between the Broken Tea, Pekoe Souchongs, Pekoe and Orange Pekoe. The Orange Pekoe has Broke

Tea in it, and the Broken Tea has Orange Pekoe in it, and so on, but (as stated before) this Orange Pekoe does not improve the Broken Tea, and the Brok n Tea spoils the Orange Pekoe. Then, is it worth the trouble, or the expense? That is the question to be worked out by each Manager. Looking at the matter broadly, there is about 40 per cent of Pekoe Souchong and Broken Tea. Of 200 million pounds of our British tea this 40 per cent represents 8 million pounds. Of this 8 million 3 per cent is good Orange Pekoe=240,000 lb. and 5 per cent is good Pekoe=400,000 lb. and if this amount of Orange Pekoe and Pekoe could be placed on the market in excess of our present offerings, it would have a marked effect on the reputation of our tea, and this could be done by more careful sorting without lowering the prices of the Pekoe Souchong and Broken Teas.—*Indian Planters' Gazette*, Feb. 5.

PLANTERS AND THE EXCHANGE QUESTION.

The United Planters' Association of Southern India has through its Chairman, Mr. George Romilly, sent the following letter to the Government of India, Financial Department:—

As we observe that the Madras Chamber of Commerce has recently laid its views on the currency problem before the Government of India, and as we note with alarm that it advocates the adoption of what is known as the Lindsay Scheme for establishing a gold standard and thereby fixing the rupee at about 1s. 4d., I now have the honour to submit for the consideration of Government the views of this Association on the subject, representing as I believe they do, not only the interests of the educated Native and European planters whom I have the honour to represent, but also the interests of the voiceless millions of native cultivators who are as yet unaware of the heavy burden under which they are laid.

2. We agree with the Chamber of Commerce that "if India is to be saved from ruin, if she is to prosper, cheap capital is absolutely necessary to develop her great resources"; but we go further than this, and maintain that not only cheap capital is necessary, but also a rupee at its natural value in order that the export trade, which is the backbone of the prosperity of India, may not be handicapped.

3. Our two chief industries are the growing of tea and coffee. Our teas have to compete with Japan and China. Japan has recently adopted a gold currency, but has fixed her exchange (doubtless having this and other competitions in view) at the present low rate ruling in silver standard countries and is for all practical purposes one of them. China has a silver standard, and a practical illustration of her favoured competition with India was recently afforded by the starting of the Foochow Tea Improvement Co. which in its prospectus lays stress on "the advantage China now has over India and Ceylon in cheap silver the exchange value of the rupee exceeding that of silver by fully 25 per cent." But taking the present intrinsic value of the rupee at between 9d and 10d and the exchange value at 1s 4d the actual advantage in favour of China amounts to 60 per cent. In like manner our coffees have to compete with those of Brazil and Central American States. Brazil has nominally a gold standard, but owing to bad financing the Milreis, its standard coin, has fallen in value during the past ten years from 27*d.* to between 8*d.* and 9*d.*, so that for all practical purposes Brazil is a country with a currency on a level with that of all silver standard countries. Costa Rica and the other coffee exporting countries of Central America have a silver standard, and consequently, with Brazil, enjoy the same advantages in their competition with Indian coffee as China and Japan have in the tea trade.

4. The Madras Chamber of Commerce admits that "Indian producers will be heavily handicapped in competing with silver using countries by a fixed 1s. 4*d.* rupee; but to attempt to fix a lower standard does not seem to be within the limits of practical politics." It is this prejudication which we would oppose. In our opinion the true solution of the present difficulty lies in the reopening of the Mints. We believe that if this were done a great stimulus would be given to the export trade of the country and capital would be again attracted. The only obstacle, which unfortunately has been allowed to overshadow the whole question, is the loss that would be entailed on the Government of India by its Home Charges. This, we believe, would be largely compensated by the increased trade and prosperity of the country, but if fresh taxation became necessary to meet the requirements of Government we as producers would prefer to submit to a small direct export tax on our producers than to have to struggle against the present crushing handicap in favour of produce from silver using countries.—*M. Mail*, Feb. 15.

A NEW IRON TEA FACTORY.

The old factory at Dunedin, Yatiyantota, which was totally burnt down some months ago, has been rebuilt and tea is made there now. The new factory is a neat and handsome building, designed and erected by Messrs. Walker, Sons & Co., of Colombo. It is 112ft. 6in. long by 35ft. 0in. wide, with engine and boiler house at one end, and a spacious firing room at the other. The office and sifting room are finely situated and fitted with large glass windows. The main staircase, which is 8ft. 11in. wide, a part for ascent and part for descent, gives a fine appearance to the factory. The woodwork is all of well-seasoned teak, and all the materials are of the best workmanship. The factory was built in 2½ months' time, and it reflects great credit on this enterprising firm in being able to get work done so rapidly and so well. The executive engineer was Mr. E.B. Rose, assisted by Mr. Peter C. Dias.—*Cor.*

THE PROPOSED LABOUR FEDERATION.

(*From the Proceedings of the Ceylon Planters' Association, held 17th February, 1898.*)

The SECRETARY took up the Rules for the proposed Labour Federation saying that they had been published in minutes of the proceedings of the Committee.

The proposed rules were taken as read.

THE PLANTING MEMBER.

The Hon. Mr. CAMPBELL said it was his duty to bring before the meeting the proposed Rules for the Labour Federation of Ceylon. They did not pretend these rules were in any way faultless. They knew it was a difficult task to make rules which would satisfy every one in a matter of this sort. He would call their special attention to rule No. 3. That rule was framed with the object of stopping roving gangs of coolies. They all knew how difficult it was to keep these gangs of the coolies on their estates and the object of this Federation was to endeavour to get the coolies to stop on the estates on which they were. If once they would get their coolies to stay with them for long periods a great many of their difficulties would vanish; they would turn out the work much better and would be more content, would earn better wages and would be in a better situation. If they agreed among themselves to get every planter to put his name down, and agreed that in no case would they give more advances than the amount put in the *tundu* they would go very far towards settling the labour difficulty.

They did not insist, in the event of any planter wishing to part with a gang, upon anything. There would be no objection to his putting on the *tundu* anything he liked. He wanted to part with them and there was no reason why they should not go to take the debt ; but when their kangani came to them and said he wanted to go they said : "Here is your *tundu*." They wanted to prevent him going to another estate and getting a larger amount than they had given to him If they did this it would prevent the Coast advances rising. If they accepted these rules that day it was but the first step. They had taken the initiative as the P. A., but the P.A. could not carry it through themselves. Everyone must help. They had limited the number of those who must support it at 75 per cent, and o herwise it could not take effect, but he hoped every planter would join the Federation and give it all the assistance in his power. He would appeal to every planter in Ceylon. Even if they could not consent to all the rules, but then at all events give the thing a trial. If they did not they remained as they now were, in the hands of their coolies, and could only go from bad to worse.

Mr. HUXLEY :—Seconded.

Mr. A. M. FORBES then asked that the rules should be read, and they were read by the Secretary.

Mr. FORBES said he could not follow Mr. Campbell in his remarks as to Rule 3. He said that in the event of their giving a *tundu* wishing to get rid of a gang of coolies, it was immaterial whether they put the amount of the advances due to the estate on it or coupled with t aany number of advances representing outside debts. He took exception to that. He thought it should be understood that when they gave a *tundu* to a gang of coolies leaving an estate they should have nothing to do with outside debts whatever (applause), and that only the mount due on that estate should be put in the *undu*.

Mr. FORSYTHE said he would like to ask what the mover would do if the kangany said "unless you include all the debts on my *tundu* I am afraid I cannot get the money in. I am afraid the coolies will run away and we shall lose half the money."

Mr. SKRINE said he supported the last speaker. It appeared to him to be class legislation. They would be putting the kanganies in a very tight place, especially on estates working on short time. The Chetty kept the coolies going and they incurred debt. In that case it was very hard if he could not get his money. If they did put the kangani in a tight place, it would do great harm to the kangani system which had worked so admirably. Indian pl nters, who knew the indenture mischief, knew how fortunate the planters of Ceylon were in having this kangani system. He thought something might be done to compel chetties to notify their claims to kanganies or the estates, but, as to the resolution itself, for his part he should demur before having anything to do with the rules.

Mr. A. M. FORBES said that in regard to what Mr. Forsyth had said, in the event of a kangani coming to them and saying "If you don't give me a *tundu* for so and so, part of the advances on the men, I shall have no end of difficulty in getting the money I owe you," he took exception to that. He said that if they did such a thing they ran the risk of laying themselves open to compounding a fraud. A kangani came to them and said he owed the kaddies this and that and the other, and what proof had they got of that. If they gave him a *tundu* for the advances actually due to the estate plus the imaginary advances he owed the kaddies, he thought they were lending themselves to what might be a fraud (hear, hear).

Mr. L. STUART said he would like to say that the whole scheme at present seemed very incomplete, but at the same time he thought it was a step in the right direction, and he hoped the move might be made (hear, hear).

The CHAIRMAN said that the few words the last speaker had said was just what the Committee thought. The Committee did not pretend to have a perfect scheme. They had done the best they could to prevent the roving about of kanganies. It was chiefly the head kanganies this would effect. The sub-kanganies would not be down in the estate books, and therefore they were obliged to take their head kanganies' word and when they were paying off a sub-kangani they must take what they agreed to between them. It was to prevent whole gangs leaving estates for the sake of compelling one estate to give them more advances. Now the one estate could refuse and the kangani demanded his *tundu* and went on to the next. The proposed rules had been largely supported, and if three-fourths of the planting community were prepared to give it a chance of working for one year, they would, he was confident, be able to improve their rules by finding where the fault lay. He thought it was worth their while to give them a chance, and he did not think it would inflict a hardship on the kanganies. He thought that under Federation they would find that after all the planters were their best friends. They were protecting them from being lifted from one estate to another, because the creditor pressed them. And he thought, when it was found they did not go, the creditor would not press them. Let them give it a trial, and before the first twelve months were out, he thought that they would strengthen the rules, that they would see the weak points in them and would have a much more workable scheme for 1898. (Hear, hear).

The question was then put to the meeting and the rules were passed with only one member (Mr. Forbes) dissenting.

CACAO DISEASE.

(*From the Proceedings of the Ceylon Planters' Association, held 17th February, 1898.*)

Mr. H. DE SANCTIS moved :—"That this Association do have an analysis made of the whole of the cacao tree, leaves, branches, stem and pods." He explained that some time ago he saw it advertised by Messrs. Freudenberg & Co., that there were rep rts by Mr. Cochran, but the pamphlet stated that t ere was no definite information available on the subject, and it struck him that that Association which had spent two or three thousand rupees on coffee might afford to spend two or three hundred rupees on cacao so as to prevent disease. If there was something wanted in the soil they wished to find that out and when they knew what a healthy tree was made of they would know what to supply. The cost for each analysis would be R50, making R250 in all.

Mr. RYAN seconded.

Mr. CHRISTIE said that as they were discussing a scientific matter in connection with cacao disease he would like to give some little information to the Association in regard to the non-appointment of a Government cryptogamist. He had

noticed in England and since he came out here various paragraphs, some from newspaper correspondents and others of more or less an editorial nature, putting the saddle upon the wrong horse. The Governor as they knew was extremely prompt in the matter and did his very best. When he got home he went to the Colonial Office and found that they had been equally prompt. He found that they had a despatch from the Director at Kew, which had since been published in Ceylon, in which he practically declined to send out a cryptogamist and suggested in the meantime getting a botanist from India. He was not at all satisfied with that and thought there was something behind it. The Colonial Office were good enough to arrange an interview between him and the Director. He heard all the Director had to say and he was not satisfied with it, but the Director showed him a letter written by their Peradeniya Director about that time specially asking him not to send out a cryptogamist—that he did not think it was fungoid and that it was inexpedient to send out a cryptogamist. Therefore it was at the request of the Peradeniya Director that a cryptogamist was not sent here. In making this explanation he did not wish it to be thought that he was blaming the Director; doubtless he did it with the best of intentions; but the effect of his letter naturally was to prevent the Director at Kew agreeing to the request for a cryptogamist.

The CHAIRMAN thought the request made by the mover of the resolution a very small one and one the Association could easily and readily comply with. He thought that it would be on the proper lines and that a Sub-Committee would be the best to see that the proper samples were given to an analyst. A Sub-Committee could be appointed at an early meeting to carry out the suggestion made by Mr. De Sanctis and the Association would be prepared to pay the fees.

This was agreed to and the Chairman intimated that the matter would be brought up at the next Committee meeting.

THE CURRENCY QUESTION.

To the Secretary, Ceylon Planters' Association Colombo.

DEAR SIR,—At the last Annual Meeting of the United Planters' Association of Southern India, I was instructed to address all the large Produce Associations, Chambers of Commerce and Mill Owners in India and Ceylon with a view of ascertaining whether they would join us in forming a combination for the purpose of representing to the Secretary of State for India and the Houses of Parliament the critical condition of the producing industries of this country; and to forcibly point out that if the present financial policy is long continued the export trade of India must seriously suffer, with the result that the final position of the Government of India will be worse than if it had never made the fatal blunder of tampering with the currency.

2. In accordance with this resolution I beg to request that you will favour me with the views of your Association. (*a*) On the closing of the Mints and the General policy of the Government of India in endeavouring to create an artifical rate of exchange. (*b*) On the effect that this artificial rate has had on your industries.

3. With regard to ourselves the effect of the present financial policy of the Government of India has been as follows:—Our chief industries are the growing of coffee and tea. Our coffee has to compete with Brazil, and our tea with China and Japan. Taking the present intrinsic value of the rupee at between 9d and 10d the Government has forced it up to 1s 4d or 60 per cent. over its real value. Brazil has nominally a gold standard, but owing to bad financing the value of its standard coin, the milreis, has fallen during the past ten years from 27d to between 8d and 9d, so that for all practical purposes Brazil is a country with a currency on a level with that of all silver standard countries. As a result Brazil has flooded the markets with coffee which she can sell profitably, owing to her low rates of exchange, at 40s per cwt. In India, on the other hand, under existing circumstances coffee cannot be produced at a profit under 80s per cwt. Luckily owing to its superior quality it can still command this price, but it has to compete with the better quality coffees of Costa Rica and other silver standard countries of Central America. We would point out to you that this action of the Government of India in maintaining an artificial rate of exchange act as a bounty in favor of those countries of 60 per cent.

4. In like manner our teas have to compete with China and Japan. The former has a silver standard, and Japan, though she has recently adopted a gold standard, has fixed her exchange (doubtless having this and other competition in view) at the present low rate ruling in silver standard countries, and is for all practical purposes one of them. Here again, owing to the action of the Government of India, China, and Japan enjoy a bounty of 60 per cent. Although Indian and Ceylon teas have been able to wrest the British and Colonial markets from China and Japan, they have only succeeded in doing so owing to their low rate of exchange in the past, and even then at a cost to themselves of more than 50 per cent. reduction in the price of their teas. It must further be borne in mind that Chinese and Japanese teas, although inferior in quality are still selling for a higher price in silver than ours and that the Japanese exports have increased during the last twenty six years, from 18¾ to 60 million lb., and the Chinese from 236 to 239 million lb. This increased export has so far found an outlet in the markets of Russia and the United States, where our competition has been less keen. The struggle that is to come must be to conquer these markets, involving in all probability a further fall in the gold price of tea. In view of these facts, we maintain that it will be impossible for Indian and Ceylon Planters to continue giving this bounty of 60 per cent to their rivals and yet compete with them successfully in the world's markets. It seems to us that the future prosperity of India and the safeguard for its increasing population, shielded by Government from war and famine, depend mainly on the cultivation of the enormous tracts of waste land that it contains, and as pointed out in the Indian article of the London *Times* this has hitherto been effected by the cultivation of articles of export such as tea, coffee, jute, cotton, wheat and seeds. Owing to the constant opening up of new countries and increasing facilities of cheap communication with the world's markets, the gold price of India's produce is more likely to fall than rise. It seems therefore the height of folly for the Government of India deliberately to throw away the advantage which a low exchange gives the export trade of India in their severe competition with both gold and silver standard countries.

6. We shall be told that the loss to the export trade is largely balanced by the gain of the import trade, but the latter is a much smaller trade than the former, is not so necessary, and depends for its volume largely on the power of the exporters to purchase imports. If the export trade suffers the import will also suffer proportionately, and the better off exporters are the more imports they can purchase.

7. We are well aware that the Government of India is not in a position to forego the saving now effected in sterling charges without increasing its taxation to a considerable extent. But we believe that if Government were to re-open the mints and refrain from tampering in any way with exchange, the export trade of India, under a low exchange, would very rapidly increase, (as has been exemplified by the coffee and wheat trades of South America) and that with increased land and other sources of revenue the imposition of a direct 5 per cent. export duty would be found sufficient to cover the loss on

the home charges. We, as producers, would infinitely prefer to submit to a direct tax than suffer this indirect loss of 60 per cent.

8. Our proposition, therefore would be that the Government of India be requested to re-open the mints that refrain from tampering in any way with the rate of exchange, and that it should refund itself for the losses caused hy this policy by the imposition of a 5 per cent. export duty.

Requesting that you will favour me with your views at an early date,—I am, dear sir, yours faithfully, (Signed) A. RONALDSON, Acting Secretary, U.P.A., S.I

MINOR PRODUCTS REPORT.

CINCHONA BARK.—The first London auctions of the year took place this week. They began quietly, and the average unit selling price at the beginning of the auction was 1¼d; competition grew keener afterwards, and rates rose till at the close the average unit for the whole auction worked out at fully 1½d, or an advance of ¼d on the last London and Amsterdam auotions. The purchases of all the principal huyers are stated beneath, first in packages and then in kilos of quinine equivalent:—

Howards & Sons	Agent for Auerbach Factory.	Agents for Mannheim and Amsterdam Factories.	Agent for Brunswick Factory.	Agent for American Factory.	Agent for Imperial Factory.	Other Buyers.
116	386	777	438	219	71	24
565	1,195	2,190	885	1,060	360	—

The following shows the days at which other descriptions were sold:—*Ledgeriana*, Javan sold at 7¼d to 7⅜d for rich ("Hybrid-Ledger") chips, 6¼d for good dusty chips, and 2½d to 2⅜d for poor dusty chips; East Indian sold at 6⅞d to 7d for ricb, part broken quilly chips, 5⅞d for good cbips and quills, 5½d to 3⅞d for good to poor stem chips, 4⅝d for root chips, and 4d to 4¼d for hranch chips. *Officinalis*, East Indian sold at 5¾d to 5⅞d for renewed broken quills and chips, 4⅝d to 5d for original ditto, 4⅞d to 5¼d for renewed chips, 3½d to 5d for original chips, 4d for original chips and thin broken quill, 4d for root chips, 3⅛d to 3¼d for poor thin chips; Ceylon sold at 9d for rich shavings, 4⅛d for original quilly chips, 3⅞d to 4d for original chips, and 3½d for renewed chips. *Succirubra*, Ceylon sold at 4⅜d for good bold chips down to 3d for fair small chips, 3½d to 3¾d for renewed chips, 1⅝d to 3d for mixed chips, shavings, and broken quill, 2⅜d to 2¾d for chips and shavings, 2½d for poor thin quill, and 1d to 1½d for the lowest parcels.

CINNAMON.—*Chips* sold this week at auction at 2¾d and *cuttings* at 8¾d. 40 bags of tbe former out of 210 offered were disposed of, and all the 14 bags of the latter put up were sold. As regards *Quills*, a very good business has been done since the last auctions. The spot prices for the various grades are unaltered, hut very little is to be had at what we quote, viz. 11d for firsts, 10½d for seconds, 10d for thirds, and 9d for fourths; the price for tbe usual assortment to arrive is 9d c.i.f.

OIL OF CINNAMON.—The cases which were taken out of last drug sales were offered together with others at public auction this week, when the whole of the 67 put up were sold "without reserve and with all faults" at from 1¾d. per ounce to 3⅜d. per ounce, the lower price being for oil mixed with water. All of these cases were "salved" from the Kawachi Maru.

OIL OF LEMONGRASS.—The present circumstances of the market are favourable to the currency of conflicting reports. It is known that pretty strong efforts are being exercised in opposing directions, one to advance, the other to depress the price, owing to a cause which we spoke of a fortnight or so ago. It seems clear, however, that very little actual business is taking place, througb many inquiries aro said to be abont. For good oil some holders asked 10d. spot whilst a medium quotation is 8d., and in one quarter 6d., is heing named, but for what sort of stuff we do not know.

VANILLOES.—The tins of these taken out of the last drug sales, as explained in a previous issue, were put up at auction last Friday, when practically the whole of the 150 offered were sold at unchanged rates. The following shows the range of price for the descriptions sold. *Seychelles*, fair to good beans sold at from 25s. to 26s. 6d. for 8 to 8½ inches, down to 18s. to 22s. for 4½ to 6½ inch. *Mauritius*, fair to good heans sold at from 21s. to 22s. 6d. for 6½ to 7 inch, down to 16s. 6d to 18s. for 3 to 4½ inch.—*British and Colonial Druggist*, Jan. 29.

PLANTING NOTES.

"SORTING TEA."—We call the attention of planters to a deliverance on this subject from the *Indian Planters Gazette* given on page 644. It is the first of a series of papers on a topic which is of practical interest in connection with Factory operations.

BASIC SLAG FOR MANURE.—In the course of last year arrangements have been perfected at Rotherham by the Parkgate Iron and Steel Company for the utilisation of the waste or by-products of the manufacture of basic or open-earth steel. Plant has been erected in a specially-constructed building for the purpose of grinding the basic slag as fine as flour, extracting the metal, and leaving a valuable phosphate manure, which is used in this country and on the Continent. The company's plant is adapted to turning out some 20,000 tons per annum.—*British Trade Review*, Feb. 1.

CEYLON PLANTERS IN HAWAII.—Mr. Hawke, of Orion, who is constantly making trips abroad from Ceylon, returned yesterday, after visiting a part of the world that Ceylon men do not often reach. Leaving Ceylon his intention was to travel *via* China and Japan to America, and so to Europe China he did not like; hut he thought Japan pleasant, and he stayed there two months. Going on to San Francisco *via* Honolulu. On his way to 'Frisco a fellow passengers on the steamer revealed himself to him as Mr. Caine, formerly of Ceylon and told him how well he was doing as a coffee-planter in Hawaii. Mr. Hawke was so interested that when he reached 'Frisco he went back to Hawaii, and he now returns from there perfectly enamoured of the place. He says the island is most suitable for Coffee planting, and a good acreage is already under cultivation, growing in rich volcanic soil—a soil that could not be found in Ceylon anywhere. Labour was plentiful, shipping facilities excellent, and Hawaiian coffee was fetching 80s a cwt.. He secured 400 acres of land at an elevation of 2,000 ft. from the Provisional Government, and he returned at once to Ceylon to make arrangements to sell Orien estate and settle down in the Sandwich Isles to plant up his new property. Almost all the coffee there is Arabian.

DEAFNESS. An essay describing a really genuine Cure for Deafness. Ringing in Ears, &c., no matter how severe or long-standing, will be sent post free.—Artificial Ear-drums and similar appliances entirely superseded. Address THOMAS KEMPE, VICTORIA CHAMBERS, 19, SOUTHAMPTON BUILDINGS, HOLBORN, LONDON.

COLOMBO PRICE CURRENT.

Furnished by the Chamber of Commerce.)

Colombo, March. 1st, 1898.

EXCHANGE ON LONDON: CLOSING RATES. *Bank Selling Rates:*—On demand 1/3 31-32 to 1/4; 4 months' sight 1/4 to 1/4 1-32; 6 months' sight 1/4 1-32 to 1/4 1-16. *Bank Buying Rates:*—Credits 3 months' sight 1/4 7-32 to ¼; 6 months' sight 1/4 5-16.

Docts 3 months sight 1/4 ¼ 9-32; 6 months sight 1/4 11-32.

COFFEE.—Plantation Estate Parchment on the spot per bushel R13.50. Plantation Estate Coffee, f.o.b. on the spot per cwt. R77·50. Liberian parchment on the spot per bus. R4·50. Native Coffee f.o.b per cwt. R44·00

TEA.—Average Prices ruling during the week Broken Pekoe, per lb. 40c. Pekoe per lb. 32c. Pekoe Souchong per lb. 25c. Broken mixed and Dust, per lb. 18c. Averages of Week's sale.

CINCHONA BARK.—Per nnit of Sulphate of Quinine per lb 7c.

CARDAMOMS.—Per lb R1·80

COCONUT OIL.—Mill oil per cwt. no quotation Dealers' oil per cwt. R12·62½ Coconut oil in ordinary packages f.o.b. per ton R290.00

COPRA.—Per candy of 560 lb. R41·00

COCONUT CAKE: (Poonac) f.o.b. (Mill) per ton, R72·50

Cocoa unpicked and undried, per cwt. R48.00

COIR YARN.—Nos. 1 to 8 { Kogalla R17.25 / Colombo R16 00

CINNAMON.—Nos. 1 & 2 only f.o.b. 57c.

Do Ordinary Assortment, per lb 51c.

EBONY.—Per ton No sales

PLUMBAGO:—Large Lumps per ton, R380

Ordinary Lnmps per ton, R360

Chips per ton, R230. Dust per ton, R150

RICE.—Soolye per bnshel, { R 3.30 to 3·60

„ per bag, { R8.50 to 8·90

Cost Kara per bus. none

Coast Calunda per bushel, R3·80 to R4·00 scarce.

Mnttnsamba per bushel, R4·30 to R4·75

Kadappa and Kuruwe per bushel, R3·45 to R3 55

Rangoon Raw 3 bushel bag.—R9.00 to 9.50

LOCAL MARKET.

(By Mr. James Gibson, Baillie St. Fort.)

Colombo Mar 2nd, 1898.

Estate Parchment:—per bushel R11·75 to 12·50
Chetty do do R11·00 to 11·50
Native Coffee } R35 to36·00
do F. O. B per cwt }
Liberian coffee:—per bush R1·50 to 1·75
do clean coffee:—per cwt R20·00 to 22·00
Cardamoms Malabar:—per lb. R1·30 to 1.50
do Mysoore do R1·50 to 2·15
Cocoa unpicked per cwt R42·00 to 46·00
do picked do R48·00 to 50.00
Rice Market List
Soolai per bag of 164 lbs nett R8·50 to 8.90
Slate & 1st quality soolai:- per bushel R3·60 to 3.70
Soolai 2 & 3rd. do do do R3.35 to 3.45
Coast Callunda R3·80 to 4.00
Muttusamba R4.30 to 4.75
Kuruvee R3.40 to 3.50
Coast Kara R3.60 to 3·75
Kazala R3·25 to 3·30
Rangoon Raw Rice per bag R9·00 to 9·50
Cinnamon. per lb No 1 to 4 00·53 to 00·56
do do 1 to 2 00 56 to 00·60
do Chips. per candy R76·00 to 77·50.
Coconuts. Ordinary per thousand R36.00 to 38.00
do Selected do R38.00 to 40.00
Coconut Oil per cwt R12·75 to 13·00
do F. O. B. per ton 287 to 290·00
Copra per candy 39 to 41 00
Kalpitiya do R37.00 to 38.00
Marawila do
Cart Copra do R33.00 to 34·00
Poonac Gingelly. per ton 91 to 93
do Chekku· do R75.78
Mill (retail) do R76.79
Cotton Seed do R81·00 to 82·00
Satinwood per cubic feet. R2.00 to 2.30
do Flowered do 5.50 to 6.00
Halmilla do 1.30 to 2.00
Palu. do 1.30 to 1.40
Tuun Pali do R1.30 to 1.40
Ebony per ton R80 to 180
Kitul fibre per cwt R35 to 00
Palmyra do do R9·50 to 21·50
Jaffna Black Cleaned per cwt 18·50
do mixed do R15·50 to 17·50
Indian do R9.50 to 17.50
do Cleaned do R12.00 to 21·50
Sapanwood per ton R50·00
Kerosine oil American per case. R7·00 to 7·25
do Bulk Russian per tin R2·50 to 2·60
do Russian in Case R5.25 to R5·50
do Sumatra in Case R4.60 to 4·70
Kapok Cleaned F. O. B. per cwt R24·00 to 28·00
do unpicked do R8·00 to 8·50
Nux Vomica do R5.00 to 6.00
Croton Seed per cwt 34.00 to 40·00

Plumbago per ton, according to quality { Large lumps 320 to 390 / do „ 200 to 380 / do Chips 190 to 200 / do dust 75 to 140

CEYLON EXPORTS AND DISTRIBUTION.

1897-98.

COUNTRIES.	Coffee cwt Plantation	Coffee cwt N'tive	Coffee cwt Total.	Cinchona. 1898 B'nch & Trunk lb	Tea. 1898 lb.	Tea. 1897 lb.	Cocoa cwt.	C'moms lb.	Cinnamon Bales lb	Cinnamon Chips lb.	Coconut Oil 1898 cwt.	Coconut Oil 1897 cwt.	P'bago 1898 cwt.
To United Kingdom	1671	..	1671	82818	14180674	13978583	13411	45662	93621	45726	6911	7108	22706
„ Austria	..	...	..	..	2590	845	...	..	...	22400	202	668	..
„ Belgium	10	..	10	..	3240	...	250	..	7500	11200	..	..	8569
„ France	..	..	..	..	3167	14468	..	..	7000	20216	..	..	333
„ Germany	..	..	..	..	68195	...	225	22546	104175	57754	709	..	5435
„ Holland	..	.	...	..	5176	3705	..	..	...	..	..	..	..
„ Italy	..	.	..	..	750	115	..	..	16500	68768	..	..	...
„ Russia	..	..	..	..	252724	..	..	..	..	..	...	..	...
„ Spain	..	..	..	...	7550	500	..	..	40000	5600	..	..	..
„ Sweden	1	..	1	..	11589	1850	...	..	..	..	..	..	101
„ Turkey	..	..	..	..	6996	300	...	..	...	..	...	..	..
„ India	4	..	4	..	42894	96812	3	4564	...	...	12360	13365	117
„ Australia	351	..	351	..	2103440	1744893	...	..	3100	3920	163	838	..
„ America	..	..	..	29448	190380	185165	77	..	10000	..	6684	4010	4529
„ Africa	..	..	..	724	72156	12687	..	...	..	..	..	..	..
„ China	200	..	200	2026	186233	94239	..	720	..	..	274	..	..
„ Singapore	1	..	1	..	6867	3273	193	400	..	..	15213	4517	..
„ Mauritius	..	..	..	..	...	...	..	..	..	..	..	..	.
„ Malta	..	..	...	...	14016	...	..	..	..	..	..	..	..
Total exports from 1st Jan. to 1st March 1898	2238	..	2238	115016	17158747		14159	73892	281896	235584	42516		41790
1897	2823	22	2845	79373	16137435		9264	66733	277603	66494	30504		29064
1896	3658	91	3749	71967	14288166		6717	40290	181770	94632	40591		34747
1895	14296	20	14316	127226	15290247		9591	94698	271470	103938	60191		34791

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Prices Current, London, February 9th, 1898.)

	QUALITY.	QUOTATIONS.
ALOES, Soccotrine cwt.	Fair to fine dry ...	44s a 100s
Zanzibar & Hepatic ,,	Common to good ...	11s a 76s
BEES' WAX, ,,		
Zanzibar & Bombay { White ,,	Good to fine ...	£7 2/6 a £7 10s
Yellow ,,	Fair ...	£6 5s a £6 7s 6d
Madagascar ,,	Dark to good palish ..	£6 a £6 7s 6d
CAMPHOR, China ,,	Fair average quality ...	95s
Japan ,,	,, ,, ,,	100s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	3s 6d a 4s
	Middling, stalky & lean	2s 9d a 3s 2d
Ceylon.—Mysore ,,	Fair to fine plump ..	3s a 4s 3d
	Seeds ...	3s 4d a 3s 5d
,, Tellicherry ,,	Good to fine ..	2s 9d a 3s
	Brownish ..	2s 6d
,, Long ,,	Shelly to good ...	2s 8d a 4s 3d
,, Mangalore ,,	Med brown to good bold	3s 6d a 3s 9d
CASTOR OIL, Calcutta ,,	1sts and 2nds ...	3⅞d a 5d
Madras ,,	...	3¼d a 3⅜d
CHILLIES, Zanzibar cwt.	Dull to fine bright ..	32s 6d a 40s
CINCHONA BARK.— Ceylon lb.	Ledgeriana Chips ...	3¼d a 5d
	Crown, Renewed ..	4½d a 8d
	Org. Stem	1½d a 6¾d
	Red Org. Stem...	3d a 4⅝d
	Renewed ...	3½d a 5⅝d
CINNAMON, Ceylon 1sts per lb.	Ordinary to fine quill...	10d a 2s 4d
2nds	,, ,, ...	9d a 1s 7d
3rds	,, ,, ...	8½d a 1s 5d
4ths	,, ,, .	8d a 1s 3d
Chips	,, ,,	2¾d a 3½d
CLOVES, Penang lb.	Dull to fine bright bold	6d a 1s
Amboyna ..	Dull to fine	4½d a 5¼d
Zanzibar and Pemba }	Good and fine bright	4⅝d a 4½d
	Common dull to fair ..	4d a 4 5-16d
Stems ..	Fair ..	1⅛d
COCULUS INDICUS cwt.	Fair ..	8s 6d
COFFEE Ceylon Plantation ,,	Bold to fine bold colory	106s a 116s
	Middling to fine mid .	95s a 105s
	Low mid. and low grown	90s a 95s
	Smalls ...	70s a 90s
Native ,,	Good ordinary	40s a 85s
Liberian ,,	Small to bold ...	38s a 50s
COCOA, Ceylon ,,	Bold to fine bold ...	76s a 82s 6d
	Medium and fair ...	70s a 74s
	Triage to ordinary ...	60s a 68s
COLOMBO ROOT ,,	Fair to good ..	38s a 58s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair .	£10 a £16
FIBRE, Brush ,,	Ord. to fine long straight	£10 a £21
Cochin ,,	Ordinary to good clean	£15 a £21
Stuffing ,,	Common to fine ..	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£12 a £26 10s
Cochin ,,	.. ,, very fine ..	£12 a £34
do. ,,	Roping, fair to good ..	£10 10s a £15
CROTON SEEDS, sift. cwt.	Dull to fair ...	50s a 60s
CUTCH ,, ,,	Fair to fine dry ..	9s 3d a 32s 6d
GINGER, Bengal, rough ,,	Fair ...	16s
Calicut, Cut A ,,	Good to fine bold ...	80s a £5
B & C ,,	Small and medium ..	28s a 75s
Cochin Rough ,,	Common to fine bold ..	15s a 30s
	Small and D's ...	10s a 20s
Japan ,,	Unsplit ...	15s a 16s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	30s a 50s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £13
	Part yellow and mixed	£8 2/6 a £10 10s
	Bean and Pea size ditto	70s a £7 12/6
	Amber and dk. red bold	£5 10s a £7 10s
	Med. & bold glassy sorts	80s a 100s
Madagascar ,,	Fair to good palish .:	£4 8s a £8
	,, ,, red ..	£4 5s a £9
ARABIC E. I. & Aden ,,	Ordinary to good pale	40s a 62s 6d
Turkey sorts ,,		65s a 85s
Ghatti ,,	Pickings to fine pale ...	12s 6d a 40s
Kurrachee ,,	Good and fine pale	52s 6d a 57s 6d
	Reddish to pale selected	30s a 40s
Madras ,,	Dark to fine pale ..	27s 6d a 35s
ASSAFŒTIDA ,,	Clean fr to gd. almonds	40s a 80s
	Ord. stony and blocky	30s a 37s
KINO ,,	Fine bright ..	12s 6d a 15s
MYRRH, picked ,,	Fair to fine pale ...	70s a 82s 6d
Aden sorts ,,	Middling to good ...	33s a 57s 6d
OLIBANUM, drop ,,	Good to fine white ...	34s a 60s
	Middling to fair ..	20s a 31s 6d
pickings ,,	Low to good pale ...	11s a 12s 6d
siftings ,,	Slightly foul to fine ...	9s 6d a 14s
INDIARUBBER, Assam lb	Good to fine ...	2s 0½d a 2s 6¼d
	Common to foul & mxd.	1s 3d a 1s 6d
Rangoon ,,	Fair to good clean ...	1s 4d a 2s 6d
Borneo ,,	Common to fine ..	1s 5½d a 1s 7½d

	QUALITY.	QUOTATIONS.
INDIARUBBER, (Contd). Java, Sing. & Penang lb.	Foul to good clean ..	1s a 2s 3d
Mozambique ,,	Good to fine Ball ..	2s 8¾d a 2s 10d
	Ordinary to fair Ball .	2s 4½d a 2s 7d
	Low sandy Ball ..	10d a 1s 1d
	Sausage, fair to good	1s 8½d a 2s 10d
	Liver and livery Ball...	2s 4½d a 2s 5½d
Madagascar ,,	Fr to fine pinky & white	1s 11d a 2s 11½d
	Fair to good black ..	1s 6d a 1s 11½d
	Niggers, low to good...	1s 5¾d a 1s 8d
INDIGO, E.I. ,,	Bengal—	
	Shipping mid to gd violet	4s 2d a 4s 9d
	Consuming mid. to gd.	2s 6d a 3s 5d
	Ordinary to mid.	1s 6d a 2s 5d
	Mid. to good Kurpah...	2s a 2s 6d
	Low to ordinary ..	1s 4d a 1s 10d
	Mid. to good Madras..	1s 3d a 2s 4d
MACE Bombay & Penang per lb.	Pale reddish to fine ..	1s 10d a 2s 9d
	Ordinary to fair ...	1s 6d a 1s 9d
	Pickings	1s 3½d a 1s 4½d
MYRABOLANES, Madras } cwt	Dark to fine pale UG..	4s 6d a 6s
	Fair Coast ..	4s 9d a 5s
Bombay ,,	Jubblepore ...	4s a 7s
	Bhimlies ..	4s 3d a 9s
	Rhajpore, &c. ..	3s 9d a 7s
Bengal ,,	Calcutta ..	3s 6d a 5s 6d
NUTMEGS— lb.	64's to 57's ..	3s a 3s 2d
Bombay & Penang ,,	110's to 65's ..	1s 4d a 2s 11d
	160's to 130's ..	7d a 1s 1d
NUTS, ARECA cwt.	Ordinary to fair fresh .	12s a 14s
NUX VOMICA, Bombay per cwt.	Ordinary to middling..	4s a 5s 6d
Madras	Fair to good bold fresh	7s a 7s 6d
	Small ordinary and fair	5s 6d
OIL OF ANISEED lb	Fair merchantable ..	7s 3d a 7s 6d
CASSIA ,,	According to analysis..	4s 9d a 6s 3d
LEMONGRASS ,,	Good flavour & colour..	8d
NUTMEG ,,	Dingy to white ..	3¼d a 4d
CINNAMON ,,	Ordinary to fair sweet..	5d a 1s 7d
CITRONELLE ,,	Bright & good flavour	1s 2d a 1s 2¾d
ORCHELLA WEED—cwt		
Ceylon ,,	Mid. to fine not woody .	10s a 12s 6d
Zanzibar. ,,	Picked clean flat leaf	[illegible]0s a 15s
	,, wiry Mozambique	[illegible]s a 11s
PEPPER (Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ..	3 15-16d a 4d
Singapore ..	Fair	4 1-16d
Acheen & W. C. Penang	Dull to fine	3⅜d a 4⅝d
PLUMBAGO, lump cwt.	Fair to fine bright bold	20s a 28s
	Middling to good small	15s a 19s
chips ,,	Dull to fine bright	10s a 15s
dust ,,	Ordinary to fine bright	5s 6d a 10s
SAFFLOWER ,,	Good to fine pinky ...	80s a 85s
	Middling to fair ..	60s a 70s
	Inferior and pickings ..	50s a 55s
SANDAL WOOD— Bombay, Logs ton.	Fair to fine flavour ..	£20 a £35
Chips ,,	... ...	5s a £3
Madras, Logs ,,	Fair to good flavour ..	£30 a £50
Chips ,,	Inferior to fine	£4 a £8
SAPANWOOD Bombay ,,	Lean to good ..	£4 a £5
Madras ,,	Good average ..	£4 a £5 nom
Manila ,,	{ Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth...	£6 a £7
SEEDLAC cwt.	Ord. dusty to gd. soluble	70s a 80s
SENNA, Tinnevelly lb	Good to fine bold green	3¾d a 4¾d
	Fair middling medium	3d a 3¾d
	Common dark and small	1¾d a 2½d
SHELLS, M. o'PEARL— Bombay cwt.	Bold and A's / D's and B's / Small	£5 15s a £6 12/9
Mussel ,,	Small to bold ...	£1 5s a £1 2/6
TAMARINDS, Calcutta... per cwt.	Mid. to fine bl'k not stony	7s a 8s 6d
Madras	Stony and inferior ..	4s a 6s
TORTOISESHELL— Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	15s a 23d 6d
TURMERIC, Bengal cwt.	Fair ...	14s 9d
Madras ,,	Finger fair to fine bold bright	18s a 19s
Do. ,,	Bulbs ..	12s a 13s
Cochin ,,	Finger ..	13s a 14s
	Bulbs ..	8s 6d
VANILLOES— lb. Mauritius and Bourbon } 1sts	Gd. crysallized 3½ a 9 in.	18s a 26s
2nds	Foxy & reddish 4½ a 8 ,,	13s a 20s 6d
Seychelles 3rds	Lean and inferior ..	7s a 11s 6d
VERMILION lb.	Fine, pure, bright ...	2s 2d
WAX, Japan, squares cwt	Good white hard ...	36s 6d

THE

AGRICULTURAL MAGAZINE,

COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for March :—

Vol. IX.] MARCH, 1898. [No. 9.

SEASON REPORTS.

WESTERN *Province.*—Paddy. Maha harvest begun, preparations in some places for Yala. Rainfall, light. The supply of fruits and vegetables was poor.

Central Province.—Paddy. Crops in various stages, prospects are considered good. Rainfall recorded in Matale, 6·19 in. No reports of cattle disease.

Northern Province.—Paddy. Crops in ear, and being harvested in some parts. In Jaffna district want of rain and the disease known as "Kurukkutti" has damaged the crop, while floods have done damage in the lower lands in Mullaittivu district, Health of cattle good. Rainfall in Jaffna 3·75 in., and 3·57 in. Mannar.

Southern Province.—Paddy. Maha crop being reaped, prospects fair. No. cattle disease. Rainfall 4·20 in. in Galle.

Eastern Province.—Paddy. In Batticaloa some damage to early Muumari crop by drought, late crop in good condition and fit for reaping. In Trincomalee crop in ear, some damage by rain. Cattle murrain has almost disappeared from the Province. Rainfall in Trincomalee, 12·51 in.

North-Western Province.—Paddy. Harvest time on or approaching and prospects good. Cattle disease prevails in many places. Rainfall at Puttalam 1·93 in.

Province of Uva.—Paddy. Fields in preparation for Maha. About Badulla crops are nearing maturity. Fruits and vegetables plentiful and cheap. Health of cattle good.

Province of Sabaragamuwa.—Paddy. Maha being harvested, weather favourable and prospects good. Province free of cattle disease. Rainfall at Ruanwella 3·48 in.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF JANUARY, 1898.

1	Saturday ..	Nil	17	Monday ..	Nil
2	Sunday ..	Nil	18	Tuesday ..	Nil
3	Monday ..	Nil	19	Wednesday ..	Nil
4	Tuesday ..	Nil	20	Thursday ..	Nil
5	Wednesday ...	Nil	21	Friday ..	Nil
6	Thursday ..	Nil	22	Saturday ..	Nil
7	Friday ..	Nil	23	Sunday ..	·06
8	Saturday ..	Nil	24	Monday ..	·20
9	Sunday ..	Nil	25	Tuesday ..	·14
10	Monday ..	Nil	26	Wednesday ..	·16
11	Tuesday ..	Nil	27	Thursday ..	Nil
12	Wednesday ..	Nil	28	Friday ..	Nil
13	Thursday ..	·87	29	Saturday ...	Nil
14	Friday ..	·26	30	Sunday ..	Nil
15	Saturday ..	·07	31	Monday ..	Nil
16	Sunday ..	·25	1	Tuesday ..	Nil
				Total ..	2·01

Greatest amount of rainfall in any 24 hours on the 13th, ·87 inches.

Mean rainfall for the month ·06 in.

Recorded by D. W. SARAM.

PROFESSOR WARRINGTON ON THE DENITRIFICATION QUESTION :

MORE REASSURING NEWS.

(Communicated.)

As was to be expected, our leading English Agricultural authorities have been critically examining into the startling results of the German

experiments with reference to which Dr. Somerville first made a communication to the R.A.S.E. Journal of September last. We have already had Dr. Bernard Dyer's deliverance (summarised in the *Observer* of the 3rd instant,) and now follows an exhaustive paper, covering 30 pages, written by no less an authority than Prof. Warrington, on the same subject. The Professor, after clearly stating the conclusions arrived at by the German experimenters, begins by tracing the history of the denitrifying question, referring to the labours of Dr. Angus Smith (1867), Mensel (1875), Deherain and Marquenne (1882), Dr. Frankland, Gayon and Dupetit (1886), Burri and Stutzer (1895.) It has beeu proved to satisfaction that the reduction of nitrates is due to certain bacteria present in abundance in the soil, in the atmosphere and all forms of organic matters; in facts these organisms may be said to be universally distributed. Their action, however, is controlled and regulated by conditions and circumstances.

There is reason to believe that animal excrements contain a greater abundance of the denitrifying organism. For one thing it may be taken for granted that denitrifying bacteria, like other bacteria present in food, pass uninjured through the intestines of animals, and will therefore be present in larger relative proportion in the solid excrement than in the original food. Again, the proportion of organisms will depend largely ou the extent and character of the exposed surface, and on the length of its exposure to the atmosphere. The denitrifying bacteria belong to a class of organisms requiring oxygen, free or combined, to accomplish their work. Nitrates contain a relatively large proportion of oxygen. It has been found that nitrates in the soil steadily diminish as the proportion of oxygen present decreases, and that denitrification is at a maximum when no free oxygen is present, as in soils saturated with water. Where then does the denitrifying organism get its essential oxygen? From the nitrates which contain it in a combined form, and which, in giving it up, become reduced to lower compounds of nitrogen, and even to nitrogen gas itself.

What, perhaps, most controls the process of deuitrification is the supply of organic matter. The abundance of the organisms is of little importance, since they are always present in some proportion, and will increase and multiply if the conditions are favourable. If the organic matter is small in quantity the denitrifying action will be proportionately limited, however large the supply of bacteria. Here, says Dr. Warrington, is where the German experimenters erred,—they sought to explain denitrification as due to the supply of additional organisms in the manures, when the results were really due to the supply of an excess of organic matter. In the absence of oxidisable organic matter it is the *nitrifying* organisms that command the situation, while with abundance of a combustible carbonaceous substance the *denitrifying* bacteria spring into activity. It is pointed out that in the German experiments with pot culture, while the quantities of nitrogen (estimated as such) was the same in different experiments, the quantity of *organic matter* was very different in each case. With intrate of soda, for instance, no organic matter was supplied; with urine and dried blood the supply was very small; with cattle manure it became very large, and indeed the German experiments themselves bear out the fact that the denitrifying action increased with the increase in the supply of *organic matter* in the manure.

Some may demur to the statement that organic matter induces denitrification, and it would, therefore, be necessary to explain that the influence of decomposable organic matter affects the process both of nitrification and denitrification. The decomposition of organic matter and its partial oxidation must precede its nitrification. If much of this preliminary work has to be done, the commencement of nitrification will be delayed; the products of the decomposition of carbonaceous matters are, indeed, inimical to nitrification. When the proportion of organic manure exceeds a certain proportion therefore, it will be understood that a nitrifying medium may be converted for a time into a denitrifying medium, the oxygen demanded by the decomposing organic matter being now obtained by the destruction of the nitrates in the soil. An organic manure which is effective when applied in moderate doses, may thus become injurious when in excess. Dr. Warrington then goes on to show that this fact, viz., that large doses of fermentable organic matter retard the nitrification of other easily nitrified organic manures, must explain the evil effects resulting in the German experiments, since in these pot experiments the additions of dung were equivalent to 40, 70, 100, and in some cases 300 tons per acre! These are quantities which, of course, are never heard of in practice, so that the great delay of the process of nitrification and the production of active denitrifying conditions, was only what was to be naturally expected under the circumstances of the experiments, and is no proof that the same action will occur to the same extent in ordinary cultivation.

But again, all kinds of organic matter have not an equal effect, and quantity alone does not determine results. We must grasp the fact, which Prof. Warrington tries hard to impress on us, that denitrification is determined by the presence of *fermentable* organic matters. Hence it was that even in the German experiments black humified horse manure, and dung applied two months before the addition of nitrate of soda, did not cause any great loss by denitrification, while the use of fresh manure resulted in considerable loss; and again sheep manure, which contains less organic matter per unit of nitrogen, and that too in an easily nitrifiable form, gave much better results than horse and cattle manure. Prof. Warrington adds that superphosphate and kainit decreased the fermentation of manure when added to it, and in this way intensified its denitrifying power. Reference is made to a very significant German experiment made with the object of arresting the denitrifying action, by destroying the denitrifying germs in dung by treating it previously with bisulphide of carbon, with the result that denitrification was as active as ever! We could not, says Prof. Warrington, have a more conclusive proof of the fact that the presence or absence of the organisms in the manure is a matter of indifference so long as the neces-

sary organisms are present in the soil. The conditions of the German experiments, contends Prof. Warrington, were clearly not such as to allow organic manures to be employed to advantage, and the results cannot be taken as indicating what may be expected to happen in the ordinary use of farmyard manure, for Prof. Wagner is himself found to admit that his former experiments showed that under *conditions which occur* in practice a large proportion of the nitrogen of farmyard manure is recovered in the crop.

We now hear of another series of pot experiments carried out at Pas-de-Calais by Pagnoul, the results of which showed that with moderate applications of dung (that is the solid excrement of manure, which in the German experiments gave the very worst results) amounting to 20 tons per acre, the return obtained from nitrate of soda and sulphate of ammonia is not decreased; indeed, in every instance the dung itself contributed to the increase of crop. Lengthy reference is then made to the Rothamstead experiments bearing on the question. Here, too, we are told that the returns yielded by nitrate of soda and ammonium salts applied with farmyard manure were "remarkably good." In one particular experiment, however, we find that when rape cake and farmyard manure were used together in certain quantities, the return was not so good (in the case of a root crop) as where rape cake was used alone; from which Prof. Warrington concludes that with 2,000 lbs. rape and 14 tons manure (the quantities used) we apparently reach an amount of organic matter in excess of what can be economically used in an average season.

The danger of denitrification reaching considerable proportions will, it is pointed out, increase as the amount of fermentable organic matter in the soil increases, and will be much aggravated by a wet condition of the land. Those who employ dung in large quantities are, therefore, more likely to suffer loss from denitrification. The mode in which farmyard manure is applied and the extent to which it is incorporated with the soil must, says Prof. Warrington, have some influence upon its action. Where it is ploughed or dug in, and thus not intimately mixed with the whole soil (as in pot culture), it would be left in a succession of layers separated by unmanured soil. The denitrifying zone is, so to speak, limited, and does not include the whole of the soil penetrated by the roots. There is thus, says Prof. Warrington, much scope for careful enquiry as to the most profitable method of employing dung with other manures. The results furnished by the field experiments at Rothamstead, both with farmyard manure and with straw (the most powerful denitrifying agents according to the German experimenters) do not substantiate the conclusions arrived at by them. The results obtained must be considered to be due to the special conditions of the experiments, and particularly to the large relative quantities of dung or straw which were employed. Prof. Warrington then indicates the lessons to be learnt from these famous experiments. One fact, he says, which we are taught is that ordinary farmyard manure is valueless as food for plants until it is nitrified, while the economy of large dressings becomes very questionable. Moderately dry soils are those most likely to yield a profitable return with farmyard manure; hence the importance of drainage. Prof. Warrington in conclusion points to the great variation in the manurial value of cattle manure, showing that its effect is clearly connected with the active and soluble nitrogenous matter it contains, while it has been shown that to the fermentable organic matters—of which the solid part of the manure is mainly composed—is to be traced the source of denitrification. The original voidings of animals, he points out, have a far greater manurial value than the final product of the manure heap. Loss of nitrogen goes on in the whole progress from the stall to the field. One practical conclusion arrived at by the writer is the economy of keeping animals *on the land* whenever practicable.

It will be seen from the resumé which has been attempted, of Prof. Warrington's exhaustive paper, that it in a great measure disposes of the difficulties created by the German experimenters, while it also deduces many useful and practical conclusions on the subject of manuring which should prove of great value to local Agriculturists. C. D.

OCCASIONAL NOTES.

Mr. D. C. Jayawardene, an old boy of the School of Agriculture has, we are glad to learn, established himself as an agent for seeds. Mr. Jayawardene was a successful student at the School where he was particularly good in field work. After completing his course of study he was for some time under Mr. J. H. Barber, and is at present on Abbotsford, Nanuoya. We understand that Mr. Jayawardene has opened out a pretty extensive garden on his own account, and we hope to hear of him before long as a local Sutton or Carter. We can highly recommend the seeds of vegetables and flowering plants supplied by Mr. Jayawardene, who has also drawn up a Catalogue of the different varieties he keeps in stock.

We have been asked to state what is the proportion of blood in the carcase of cattle, and the percentage of water in the blood. Steel in his Treatise on the Diseases of the Ox mentions that the blood of the ox forms $\frac{1}{19}$th of the weight of its body (that of the horse being estimated at $\frac{1}{18}$th). Roughly blood may be said to yield on evaporation 20 per cent solid residue, and 80 per cent water.

The Sugar Industry in the West Indies has come to a critical condition, owing to low prices and the large importation of Indian Cooly labour. Demerara, which is not making its profits out of sugar, has just now half a million of coolies on hand. "These coolies," says the *Indian Agriculturist* for March last, "must by the contract made with the Indian Government receive constantly three shillings a day, or else Demerara must pay their passage and expenses back to India. Say that costs £10 a head, Demerara cannot get rid of her coolies without paying a fine of five millions. She must therefore go on Sugar growing whether she likes or not. But, wherever sugar can be grown rhea can be grown also; and cooly labour is quite

sufficiently skilled not only for cutting the crop and stripping the bark by hand or machine, but also for preparing the filasse."

An Ideal Department of Agriculture and Industries is the subject of a paper reprinted in the Yearbook of the Department of Agriculture, 1896. The report of the Parliamentary Recess Committee on the proposal to establish a department of Agriculture and Industries for Ireland, submitted to the Chief Secretary by the Right Hon. Horace Plunkett, M.P., Chairman, on August 1st 1896, contains among other valuable reports the admirable paper by M. E. Tisserand referred to above. The Report of the Parliamentary Committee says: "M. Tisserand is universally acknowledged to be one of the first authorities in Europe on Agriculture and the administration of aid to agriculture by the State, and the French Ministry of Agriculture, of which he may be described as the permanent head, has been to a large degree shaped by his hand." The paper which was prepared at the request of the Committee contains "such advice as his unique experience would prompt him to offer on the constitution of a ministry of Agriculture". Although prepared for adoption under special conditions, it is a paper of such breadth of view and general importance that it ought to be consulted by every State, not omitting our own Government, which, it must be admitted, is very backward in the matter of aiding agriculture. Referring to the director or minister of agriculture M. Tisserand, in one part of this admirable report, says that "It means for the man who is placed at the head the obligation to study the needs of agriculture, to surround himself with the necessary assistants for the purpose, to cause the extent of the problem to be understood, to seek for practical solutions, to point them out to Government, and to see that they are adopted." And who does not wish to have such a head to direct agricultural education and improvement in Ceylon!

Arrangements have been made for a series of lectures to be delivered at the School of Agriculture. The first of the series, on Physical Exercise, was delivered by Dr. W. H. De Silva, M.B.C.M., on Tuesday, the 15th February, to a very appreciative audience.

Mr. G. W. Sturgess, Colonial Veterinary Surgeon, left for Bombay and Karachi by the "Laos" on the 14th February to bring over a supplementary stock of Sind cattle for the Government Dairy. A number of cows and calves drafted from the Dairy herd will be sold on the 4th of March next.

The final examination of the present Forestry class began on Tuesday, the 15th February, and lasted till Wednesday the 23rd idem, Mr. W. Ferguson, Asst. Conservator of Forests presiding. The Entrance Examination for the new class was held on the 14th and 15th February (when six candidates presented themselves) under the supervision of Mr. Gillam, Superintendent of the Forest Timber Depot, Colombo. The new term begins on March 1st.

Specimens of Ramie fibre lace made at the instance of the School of Agriculture by the scholars of the Kandy R. C. Convent, have been sent to London for an opinion.

We understand that two enterprising gentlemen are intending to start the extraction of Ramie fibre in Ceylon, one using the McDonald Boyle machine and another the Favier machine. The interest in Ramie fibre is gradually taking practical form.

COCHIN COCONUT OIL.

We are indebted to the Principal of the Madras College of Agriculture for the following note by Mr. Menon of the same institution.

"The name 'Cochin oil' in the London market denotes all coconut oil sent from the West Coast *i.e.*, the 'Malabar Coast.' 'Cochin oil' does not mean exclusively oil from the Cochin State. As the port of Cochin from a very long time was the active centre of the coconut oil trade, the name 'Cochin oil' came into vogue in the London market for all coconut oils from the Malayalam side as distinguished from 'Colombo oil' for all coconut oil exported from the island of Ceylon. The process of manufacture is the same as in Ceylon. It struck me while I was in Colombo some years ago, that the harvests were too early, and that the coconuts were not fully matured. Of course we know from experience that immature coconuts give muddy oil. No doubt more attention is paid on the Malabar Coast to the curing of the kernel. In Colombo artificial methods are employed for drying coconuts before milling, whereas on the Malabar Coast they are naturally dried. During the heavy rains of the S.W. monsoon the nuts are preserved in elevated sheds and receive smoking. The good 'copra' of commerce is obtained thus. I don't think the superiority of 'Cochin oil' is due to any superiority in the variety of the coconut tree. The Ceylon coconuts compare very favourably with the Malabar ones. Perhaps *one main reason* for the superiority of the 'Cochin oil' might be found in the fact that throughout Malabar, Cochin and Travancore, coconut oil is an article of diet. Ghee is seldom used even by the wealthy For all culinary purposes, even in the Royal families of Calicut, Cochin and Travancore, only coconut oil is used. This direct patronage by the aristocracy and the whole public must have greatly contributed towards the excellence of the oil.

"The whole question requires a thorough investigation before any definite conclusion could be arrived at. I give what appears to me to be the probable causes. Mr. Drieberg's enquiries cover a vast area, and I am sorry I am unable to give more information at present."

Mr. Menon then furnishes a list of names of persons who may be consulted on the subject, and kindly adds, "if necessary, I shall prepare a a few queries which might facilitate matters."

NOTES ON RINDERPEST.

I propose in these notes to give some idea of how rinderpest sometimes breaks out in the villages of the North-Central Province. There is a tendency among the villagers to hide the facts connected with the origin of an outbreak; but by enquiry I have found that most outbreaks can be traced to a certain extent. I shall give a few examples to illustrate this.

There was an outbreak at Onegama, a Moorish village situated ten miles east of Polonnarua in Tamankaduwa District. At first I was not able to find out how the disease was introduced, as I could not have got any clue as to its origin. But I was able to ascertain the facts in a neighbouring village. Some of the draught buffaloes in Onegama had been lent for paddy-field work in the Eastern Province. Shortly after they were lent, rinderpest broke out in that part of the Eastern Province where these cattle were working. The owners hearing of the outbreak went and brought back their buffaloes to Onegama in order to protect them from the disease. But soon after they reached the village it was found that they had already caught the contagion, and from them the disease spread throughout the village.

Again, at Bulankulam, a village situated a few miles north of Maradankadawela, and about a mile from the Matale road, a serious outbreak of the disease took place lately. It was brought to my notice about a month after it began, and the Velvidane of the village, whose cattle were the first to be attacked, bitterly complained that he had lost almost all his cattle. Questioned as to the origin of the outbreak, he said he was utterly ignorant of it; nor could I elicit any information about it from any other resident in that village. But subsequently I heard in another village that the Velvidane himself had introduced the disease unawares, and it came about in this wise:

One day while out in the jungle he found the carcase of a coast bullock lying there. Its long tapering, polished horns looked very attractive, and the Velvidane removed them and fixed them in the calf shed. A few days afterwards one of the calves got ill and died. In a short time another calf died, and then another took ill. The Velvidane noticing his calves getting ill and dying in rapid succession, suspected that some one had "done *hoonium*" to them by invoking an evil demon against them, and consulted the deity in a temple close by. The deity, through its spokesman, confirmed the man's suspicion, and suggested some medicine in which the dung of the ass was one of the ingredients! The medicine, however, was of little avail, and from the calves the disease spread to the older cattle. It was not until several of the cattle were attacked that the Vidane suspected the disease was rinderpest. Of course he tried to keep the history of the pair of horns and the fact of the outbreak as secret as possible; and it was after the disease had spread throughout the neighbouring village of Amune that it was noticed by the higher headmen.

In another instance which took place near Kalawewa the disease originated from some infected hides which happened to be placed in the loft of a cow shed. On a wet day the shed began to leak, and drops of rain fell on the hides and trickled down to the place where the cows were tied. So these were attacked first, and from them the disease spread to the other cattle in the village.

The question whether rinderpest is enzootic in Ceylon is very important in connection with the prevention and suppression of the disease. It is difficult to prove that it is enzootic, for one must be able to show that all sources of mediate as well as immediate contagion have been absent before asserting that it is enzootic. It is the experience of the oldest men living in this Province that rinderpest was very uncommon here before the opening of roads, and they believe it is introduced by cattle newly brought from India.

Even supposing the disease is enzootic it is clear that it is at times introduced afresh by infected cattle from India driven across the Province. A strict watch should, therefore, be kept on such cattle; and they should be carefully examined both while landing and at certain stations along the course of their journey. Any found attacked with rinderpest should be destroyed and the rest quarantined; and in this connexion it must be noted that the importation of several hundreds in one herd is objectionable, as they cannot be managed in case an epizootic breaks out among them.

E. T. HOOLE.

Anuradhapura, 24th January, 1898.

THE EFFECT OF DIFFERENT MANURES ON THE QUALITY OF PRODUCE.

In the *Ceylon Observer* of December 20th last is published a press "interview" with Mr. A. Baur who has lately established manure works in Ceylon. In this interview we find the following statement :—"Mr. Hughes, in whose judgment must be placed the greatest value, expressing the opinion that no blood, raw bones, or fish should be used, as strong-smelling substances taint the value of tea." Mr. Hughes, who is here referred to, is the well-known Agricultural Chemist who has in a great measure identified himself with the tea industry in Ceylon, and it will be seen that his remarks with reference to the effect of manures on the quality of the crop have special reference to the tea plant, the flavour of the produce of which is so important a factor in its market value. On reading the opinion quoted above, one is at first naturally inclined to consider it rather a sweeping statement, as altogether prohibiting the use of so well-established and valuable a fertilizer as blood, and a subsequent explanation offered by Mr. Baur himself in the *Observer* of December 23rd, comes as a sort of relief. In this statement Mr. Baur says : "With reference to your comments on the question of the tainting of the flavour of tea by the application of strong-smelling manures like blood or fish, it would read as if the chief argument of Mr. Hughes against their use was in this direction, whilst on the contrary the principal objection against them, and raw bones, was on the grounds of the risk of their introducing some fungoid disease." From this explanation we may infer that Mr. Hughes did in some measure object to the use of the manures referred to, on the score of their tainting the flavour of tea (but to what extent we are not told), if we are warranted in inferring even this much. Under the circumstances we are inclined to think it most advisable that he question of the tainting of tea by strong-smelling manures should be submitted to Mr. Hughes for special opinion.

Mr. Baur also states, in the explanation referred to, that "as a practical demonstration one of the leading agronomists of France submitted to me samples of wine from a vineyard which had been manured with a strong-smelling fertilizer, and the flavour of which had been distinctly affected, while the wine from the unmanured plot of the same vineyard was all right." We do not know whether we should infer that the wine reproduced in its flavour the corresponding objectionable smell of the manure, but we may at least conclude that the flavour of the grapes was materially impaired,—and to that extent had its market value depressed—which is serious enough. We have heard it said that vegetables manured with foecal matter at the Straits, emit "when they are cold" a distinct odour of the foul fertilizer employed, and that the flavour or aroma of tobacco is appreciably affected by *buffalo* manure, which is, therefore, avoided by growers of the fragrant weed. The manuring of the betel-vine, it is well known, calls for the greatest caution.

All these opinions and experiences may have an important bearing on the question of economic manuring, and for that reason it should be ascertained whether there is sufficient grounds for believing that the peculiar compounds which impart special odours to manurial agents are, as such, absorbed by plants, retained in the cells of existing tissues, and even transmitted to new-formed organs such as the fruit.

Agricultural Chemistry tells us that plants partake, so to speak, of a regular diet of necessary plant food, the ingredients of which may, of course, be absorbed in greater or less proportion according to the species or variety of the plant; it also allows that they are able, to a certain extent, to take up useless and deleterious substances found in the soil, and thereby to do even fatal injury to themselves. Prof. Warrington says that "The roots take up apparently all diffusible substances which are present in the water which they draw up from the soil."

Are we then warranted in assuming that the roots of plants are capable of absorbing solutions of strong-smelling compounds, as such, together with their normal food ingredients, and reproducing a correspondingly objectionable flavour in their structures, whether leaf or fruit?

Referring to Prof. Warrington again, we learn that "a plant is capable of making use of nitrogen in the form of nitric acid or ammonia; it also, according to various experimenters, is able to assimilate nitrogen in the form of urea, uric, and hippuric acids and several other amide bodies. The facility, however, with which ammonia and other nitrogenous substances are converted into nitric acid in the soil is so great, that nitrates become by far the most important source of nitrogen at the plants' disposal. Could it be, then, that such compounds as urea as well as organic nitrogenous acids found in, or produced by the decay of, organic substances,—and yet to be decomposed into their ultimate constituents (ammonia, carbonic acid and water)—are instrumental in producing the objectionable flavours due, as is alleged, to the use of animal fertilizers?

That organic manures do produce distinct results, as regards quality of produce, is borne out by a report on "The Fertilization of the Soil as affecting the Orange in Health and Disease," made to the Department of Agriculture, United States, by Mr. H. J. Webber:—

"The nitrogen used in fertilization," says Mr. Webber, "is derived from mineral or organic sources. Of the former sulphate of ammonia and nitrate of soda are the forms most used; of the latter, muck, dried blood, blood and bone, cotton seed meal, tankage, fish scrap, stable manure, &c. are the forms most commonly employed. Barn manure is largely used by many growers who hold that chemical manures are injurious to plants." The most important conclusions that are to be drawn from Mr. Webber's report are thus summarized:—

(1) By a proper combination of the various elements used in fertilization one can undoubtedly largely govern the quality and flavour of the fruit.

(2) To obtain a fruit with thin rind, use nitrogen from inorganic sources in moderate quantities, with considerable potash and lime.

(3) To sweeten the fruit, use sulphate of ammonia in considerable abundance, decreasing the amount of potash.

(4) To render the fruit more acid, increase the amount of potash and use nitrogen from organic sources.

(5) If it be desired to increase the size of the fruit, as is sometimes the case, apply a comparatively heavy dressing of nitrogen in some organic form, and slightly decrease the other elements. In the case of the Tangerine and mandarin, where a larger size is usually desired, a heavy dressing of nitrogen fertilizers would favour this end and is not objectionable unless carried to excess.

(6) Fertilization has an important bearing on disease.

(7) "Die-back," a serious malady, is in all probability the result of over-feeding with nitrogenous manures from organic sources. These manures, if used at all, should be used with great caution.

(8) Foot-rot, although not primarily due to improper methods of fertilization, is no doubt considerably influenced by this cause.

(9) Insect diseases are also apparently influenced by the use of fertilizers, organic manures rendering the trees more liable to injury from this source than chemical fertilizers.

Mr. Walter Scott Campbell, of the Agricultural Department of New South Wales, commenting on Mr. Webber's reports, gives it as his opinion that many of the differences in the results of manuring with different fertilizers are to be attributed to the character of the soil. He points out that the orange soils of Florida, the scene of Mr. Webber's experiments, are sandy and sterile. He speaks to having seen both good and bad results of organic manuring. He specially mentions volcanic soils, and believes that in them organic manures will be advantageous, particularly green-manures such as the cow-pea. Mr. Campbell makes special reference to the action of organic manures in improving the texture of the soil, and the good effects traceable to their power of liberating unavailable plant food during their decomposition.

Some cultivatours give it as their experience that some plants are better able to deal with bulky and organic manuries than others; the former, for this reason, being refrred to as "gross feeders.'

We have written enough, we think, to indicate the need there is for special research into the subject of

manures, their action on the quality, and especially the flavour of produce, the relation of different manures to soils of different characters, and to the nature of the climate, particularly temperature and rainfall. All these are questions for the Agricultural Chemist to study *on the spot*, and it will be to the advantage of the agriculturist as well as the manure merchant to see that they are solved by a competent authority. It will not do for any one to dogmatise in the face of the many apparently paradoxical facts that have to be carefully considered, and as carefully worked out in practice, before he can attempt to offer an opinion on so complicated a question. It is enough for us to remember what has been already hinted at, viz., that the action of a manure depends not only on its own inherent qualities, but on the soil, the conditions of temperature and rainfall, as well as the character of the plant to which it is to be applied.

POTASH AND ITS FUNCTIONS IN AGRICULTURE.

The following is a brief summary of an exhaustive paper on the above subject by the Chief of the Division of Chemistry in the United States Department of Agriculture:—

1. The potash used in fertilizers and found in the soil has been derived from the decay of minerals containing it as an ingredient, and chiefly from feldspars.

2. During the progress of weathering, a portion of the potash in original rocks becomes soluble and is lost by lixiviation. As a rule, about 25 per cent of the potash finds its way by this means into the streams and seas.

3. There is usually a less percentage of potash in the finer particles of soil than in the coarser particles, and this is due to the fact that the solvent action of water is more strongly exerted upon the finer particles.

4. The potash is quite evenly distributed both in the soil and subsoil, there being only a slightly greater proportion in the deeper layers, doubtless to the fact that they have not been so thoroughly leached.

5. The solubility of potash in the soil is very different for different solvents, the least for the weak organic acids and greatest for the strong mineral acids. Hot hydrochloric acid extracts from the soil about 20 per cent of its total potash content, which is about thirty-two times as much as is removed by a 1 per cent citric acid solution.

6. A fertile virgin soil contains about 2 per cent of total potash, or about 70,000 pounds per acre taken to the depth of 1 foot. A crop removing 50 pounds of potash a year could be grown consecutively for about one thousand four hundred years on such a soil before exhausting all the potash which it contains.

7. The soil retains a certain quantity of fertilizing material with such tenacity as to render it practically impossible for plants to withdraw the whole of it, thus protecting the future against the rapacity of the present.

8. The quantity of potash removed by various crops per annum varies greatly. The largest quantities are removed by beets, and the smallest quantities by cereals and cotton. Beets may remove as much as 100 pounds per acre, cereals about 30 pounds, and cotton about 23 pounds for the average crops as produced in this country. In Germany, beets grown for forage remove often over 200 pounds of potash per acre from the soil, clover hay about 74 pounds, and tobacco the same quantity.

9. Tobacco contains a larger proportion of potash than any other common crop, viz., about 40 parts per thousand of the dry leaves. Forage beets contain 35, potatoes 20, sugar beets 18, clover hay 19, beans 13, and cereals 5 parts per thousand.

10. There is about four times as much potash in the straw of cereals as in the grains, while in peas and beans the proportion is about as two to one.

11. A soil which yields about 0·01 per cent of potash to a 1 per cent citric acid solution, and contains about 0·30 per cent soluble in hydrochloric acid does not usually need a potash fertilizer.

12. The potash salts which supply the commercial potash fertilizers of the world have been deposited as the result of the evaporation of saline lakes charged with potassic materials.

13. The commercial potash of the world is derived almost exclusively from the neighbourhood of Stassfurt, in Germany. The quantity of crude salts annually mined is about three-quarters of a million tons, worth nearly three million dollars.

14. The high-grade commercial salts used for fertilizing purposes are manufactured from the crude salts, and are to be preferred when shipments are made to great distances and at high rates of freight.

15. The principal crude potash salts used for fertilizing purposes are kainite containing 12·5 per cent of potash, and carnallite containing 9·9 per cent.

16. Tobacco waste, cotton seed hulls, and wood ashes also furnish important quantities of potash for fertilizing purposes.

17. Recovered marsh or swamp lands and lands containing large quantities of sand need, almost universally, potash fertilizer. The percentage of potash in soils usually rises with their content of clay.

18. The maximum effect from fertilization with potash is secured only when other plant foods are supplied in such a way as to make a well-balanced ration, and where proper methods of culture are employed.

19. Lime is an important adjunct to potash fertilization, and, as a rule, should be added to a soil in large quantities wherever potash is applied.

20. The best kind of potash fertilizer is determined by local conditions, freights, and the nature of the soil and the crop. Fertilizers containing considerable quantities of chlorine should never be applied to vineyards and tobacco fields.

21. In intensive pot or garden culture, where highly-concentrated plant foods are desired, and where the cost of the fertilizer is unimportant, potash may be applied in the form of phosphate or nitrate.

22. In some soil potash salts, in common with other saline bodies, produce injurious effects by reason of their hygroscopic nature, attracting moisture, and, on drying, producing a cementation of the soil, which renders it impervious to water and impenetrable by the rootlets of plants.

23. Crude potash salts can be applied with benefit in the preservation of stall manure, but their value for this purpose is perhaps over-estimated.

24. Potash fertilizers should, as a rule, be applied in the autumn, or at least from two to four weeks before planting, and should be thoroughly worked into the deeper part of the soil in order to come into contact with the rootlets of the plant.

25. The germination of seeds, especially if they have a low vitality, is retarded by bringing them into direct contact with potash salts.

26. The application of crude potash salts to a soil which is not easily cemented may be useful during a dry season by reason of their power of attracting and holding moisture.

27. Potash salts favor the decomposition of mineral particles in the soil, and thus tend to add to the stores of plant food therein.

28. The application of crude potash salts to the soil tends to protect the crop from frosts by preventing the too rapid evaporation of moisture and by producing a more luxuriant foliage.

29. The too abundant application of potash to the soil may become injurious by reason of the retardation of the process of nitrification which it produces.

30. Crude potash salts, especially kainite, when added abundantly to a soil, are said to act, to a certain extent, as an insecticide or a preventive of disease, and when mixed with stable manure act as a preservative by checking the activity of the denitrifying ferments.

31. It is impracticable to give formulas for the preparation of fertilizers containing potash, since both the quantity of potash to be used and the form in which it should be applied are determined by local conditions, which cannot be taken into account in the preparation of directions for the use of fertilizers.

TEAT TROUBLES.

It is sometimes found that cows have naturally malformed or imperforated teats. In such cases the gland, of course, enlarges, but there is no exit for the milk and inflammation results from its retention. In some instances an incision at the end of the teat may open a partially developed duct from which the milk may be drawn off by a tube or syphon, but usually abcesses form and the curdled and decomposed milk is thrown of with the pus. Cows with congenital defects such as malformed and imperforated teats, and, as some times found, without any teats at all should not be bred with.

Warts on the teats, especially of heifers, are a common source of trouble to the milker, rendering the animal difficult to milk owing to the soreness occasioned by the regular friction twice a day, and occasionally, when growing on the end of the teat, causing occlusion of the duct. This leads to retention, and, in its turn, to mammitis in more or less severe form. The cause of these circumscribed growths is a moot point. Some associate them with dirt, others with what has been called a warty diathesis, but the tendency is now to regard them as the work of a specific organism. Dirt may be favourable to its development, but we certainly frequently meet with animals growing warts the cleanliness of whose skins leaves very little to be desired.

It is sometimes found that after the animal has calved the warts disappear as mysteriously as they appeared, but the worst of waiting and hoping is that should they persist they become sore from friction, while the treatment is more difficult than when the animal is dry. Interference after calving necessarily occasions even more soreness than friction by the hand in milking, and it is generally better to take steps for the removal of warts in good time, so that the teats may become perfectly healed and the skin hard before regular milking becomes a necessity. Soreness of the teats from any cause invariably causes great difficulty in getting the animal to stand quietly, and where it does not lay the foundation of kicking or viciousness, it may lead to the retention of the milk. The method of removal depends largely on the nature of the growth. An excrescence on the point of the teat, or any case where the attachment is by a narrow neck, is best removed by ligature, *i.e.*, tying it tightly round the base with a waxed thread or piece of suture silk, so that the supply of blood by which it is nourished is cut off, when, as the result of the strangulation, it dies and drops off.

In most cases, however, of warts on the teats they are very numerous, and have their bases so diffuse that a ligature is out of the question. Some heifers have their teats, and in some cases portions of the mammary gland, so completely covered with small excrescences, popularly known as "seed" warts, that nothing can be done for their destruction except the application of caustic agents.

A remedy of this class, specially applicable to warts on the teats, and growths too small to ligature, is a formula introduced some time ago by M. Bondeaud. It consists of—Arsenious acid, powdered gum arabic, and powdered savin, of each 10 parts ; simple cerate 36 parts. This when made semi-fluid by heat forms a very adhesive application. It should be spread over the surface of the warts, carefully avoiding the skin, by means of a camel-hair pencil. Another formula, to be employed in the same way, is—Corrosive sublimate, 1 part ; castor-oil collodion, 30 parts.

Soreness of the teats from erythema can be best prevented by carefulness in milking, and drying them so as to avoid chaps and craks. The benzoated ointment of oxide of zinc is a useful application, or, as an alternative, the glycerine of carbolic acid may be tried. Once they become sore the necessity for regular milking interferes so greatly with healing that it is much better to use every endeavour to prevent the trouble than to cure it.

Wounds of the teats are not uncommon, indeed are met with increasing frequency since the introduction of barbed wire. Those of a superficial character require treatment similar to soreness of the teats, viz., careful milking, or the use of the teat-syphon for the removal of the secretion, in order to interfere as little as possible with repair, and mild astringent dressings to facilitate drying up of the sore. Wounds that tear or penetrate the substance of the teat and establish an opening into the duct are much more serious. A fistulous opening is then established, from which the milk squirts in a powerful stream when the teats are

manipulated, and the opening is by this means effectually prevented from healing. Little or nothing can be done while the cow remains in milk, but the repair of such an injury is not beyond the skill of the surgeon after she has been dried off. Occasionally, however, interference with a fistulous opening will cause inflammation of the lining membrane of the duct, which may lead to its thickening or occlusion, and as it is better to have two holes in a teat than none at all, it should be seriously considered whether the benefit likely to result is worth the risk.

Occlusion of the duct and obstructions in the passage are by no means rare. For cases of stricture or thickening, occurring as a complication of mammitis or resulting from inflammation of the lining membrane of the duct set up as suggested above, there is nothing that can be done to give relief except the frequent passage of probes or syphons of gradually increasing size.

Obstructions to the free flow of milk, other than stricture, consist either of small growths attached to the lining membrane or of lacteal calculi or milk-stones. Small tumours attached by pedicles to the membrane may be felt to block the passage as the teat is manipulated with the hand. They are difficult of removal ; in fact, it can only be accomplished with a specially designed instrument. Masses of curdled milk or lacteal calculi, to be felt as nodules along the course of the duct, can sometimes be extracted, but the usual plan is to push them back into the galactophorous sinuses, where they sometimes remain. A quill, or wing-feather of some bird, is generally the rough substitute for a probe employed, but in every place where cows are kept, proper silver-plated teat tubes or milk-syphons should be kept for use as required. As all impediments to the free flow of milk tend to cause mammitis, garget or indurated udders, from retention of the milk, every care should be taken to overcome obstructions, and that all the milk is obtained in spite of the difficulty or the longer time occupied in stripping the udder.

Relaxation is a teat trouble of a different order to those we have been considering, since in this case a free flow takes place resulting in more or less loss of milk. The original cause is generally over-distension, giving rise to a weakness of the sphincter or ring-like muscle by which the milk is normally retained, but in some cases there may be a natural weakness. The milk either drips away as the cow stands, or squirts out in a forcible stream as the animal moves, and the distended bag is pressed by the thighs. Narrow-built animals with well-developed udders waste most when the sphincters are weak, but as a rule the loss is less than is supposed, since a little milk, like a little blood, makes a much bigger show on the ground than it does in a pail. There is nothing can be done in these cases but to replace the weakened muscle by an artificial sphincter in the shape of a rubber ring, designed to fit with sufficient accuracy to close the passage but not to strangulate the teat. Here lies the difficulty, since if the ring does not compress the teat tight enough to close the duct it is useless, while if it is tight enough to cause constriction it will cut into the teat substance and cause soreness, or by interfering with the blood-supply cause it to atrophy just as we cut off a wart by ligature. The best way out of the difficulty is to set the cow that wastes her milk to rear calves, who will see that the udder does not become over-distended, and when she is too stale for this business, to dry her off, and fatten her out.—*M.R.C.V.S. in Mark Lane Express Almanac.*

GENERAL ITEMS.

According to Mr. McJanet's well-known tables, the live weight of cattle is to the deadweight as 7 is to 4, or the deadweight is 4/7 of the live weight. Thus the carcase of an annimal when live weight is 7 cwt. with weight 4 cwt.

The *Australian Tropiculturist* for January publishes the 4th prize essay on the slaughter of cattle. We have already reprinted one of the most instructive of these essays, and do not therefore consider it necessary to reproduce the latest one in extenso, though the subject is of local interest. The writer of the present paper (J. Lindsay) mentions that the old theory of starving cattle for longer or shorter periods before killing, is now quite exploded, and all practical men agree that the better the animal is treated in the matter of rest, food and water, the more wholesome will be the meat. For oxen, the writer considers the pole-axe the most efficient and humane means of slaughter, far preferable to "Greener's" system. The most humane method of killing calves is said to be by stunning them with a mallet and then inserting a small knife at the back of the neck and severing the spinal cord, thus destroying all sense of feeling; the head, being immediately severed, is preserved in good and saleable condition. The practice of bleeding calves is nearly or quite discarded, as it is now generally held that the colour of the flesh depends entirely on the feeding. In slaughtering sheep the best is the method in vogue of inserting a sharp-pointed knife just behind the jawbone and quickly severing the spinal cord.

Pea-nuts or ground-nuts are now recommended as a cure for consumption. The *Journal of Hygiene* states that Dr. Brewer's treatment of consumptives consists of inhaling the fumes of vinegar and the eating of pea-nuts. He gives his patients as many pea-nuts as they can eat without injuring their digestive organs. Two young ladies, who had been the rounds of the doctors and taken cod-liver oil and tonics till they were nearly dead, were put on his treatment and recovered. Concerning these cases Dr. Brewer says:—"I now commenced feeding pea-nuts. One would think this a very indigestive diet, but they craved them, and it has always been my policy to find out what my patients desire to eat, and unless it is too unreasonable I humour them. Both young ladies have become quite plump, and after a year's inhalation have ceased coughing, and I pronounced them well. The pea-nut was long known as an excellent fat producer, and much more agreeable than rancid shark-oil that oftentimes is sold for cod-liver oil. While not all can digest pea-nuts, a great many, even with feebledigestion, eat them without discomfort."